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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 1997

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Energy and Water Development Approp...

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

JOHN T. MYERS, Indiana, *Chairman*

HAROLD ROGERS, Kentucky
JOE KNOLLENBERG, Michigan
FRANK RIGGS, California
RODNEY P. FRELINGHUYSEN, New Jersey
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NOTE: Under Committee Rules, Mr. Livingston, as Chairman of the Full Committee, and Mr. Obey, as Ranking Minority Member of the Full Committee, are authorized to sit as Members of all Subcommittees.

JAMES D. OGSBURY, BOB SCHMIDT, JEANNE WILSON, and DONALD M. MCKINNON, *Staff Assistants*

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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 1997

WEDNESDAY, MARCH 27, 1996.

NUCLEAR REGULATORY COMMISSION

WITNESS

SHIRLEY ANN JACKSON, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. MYERS. The Committee will come to order. This afternoon we are pleased to have the Nuclear Regulatory Commission's three members. There had been a time when we had five and almost to the point where if only three were here we couldn't conduct business. That collegial relationship you seem to have at the Commission, you still have that? You can't talk to anybody unless they're all three together?

Ms. JACKSON. We have our restrictions but we're totally collegiate.

Mr. MYERS. Must make interesting rest room talk.

Mr. ROGERS. I don't know. I'm not always there.

Mr. MYERS. Somehow you still fit in, I guess. Well, we're pleased to hear Chairman, Chairperson. That's not a generic term.

Ms. JACKSON. It's Chairman.

Mr. MYERS. Chairman. We're pleased to hear from you. Your prepared statements will be placed in the record. You may proceed as you like.

OVERVIEW

Ms. JACKSON. Thank you. Mr. Chairman and members of the Committee, we are pleased to appear before you to discuss the Nuclear Regulatory Commission's budget request for fiscal year 1997. Accompanying Commissioner Rogers, Commissioner Dicus and myself are the NRC Executive Director for Operations and Chief Financial Officer, the General Counsel and the Inspector General. Before proceeding with my opening statement, I want to express the Agency's appreciation to Chairman Myers as well as to Congressman Bevill for three decades of distinguished service in the U.S. House of Representatives. Over the years the NRC has had the benefit of your critical but fair review of our programs and operations and we would like to extend our best wishes to you in your future endeavors.

Mr. MYERS. He'll be here shortly. He is with a group in his office and couldn't get here right away but thank you.

Ms. JACKSON. Today I will highlight the NRC's vision for the future and our approach to accomplishing that vision and then address the specifics of the NRC's fiscal year 1997 budget request. A discussion of the NRC's major program areas is included in our prepared statement, which, with your permission, we are submitting for the record.

With respect to the vision for the NRC, the environment within which we operate is changing in many ways. The NRC, as is the case for all government agencies, is facing increasing budget constraints. Likewise, those we license and regulate to ensure the safe use of nuclear materials are facing economic constraints of their own. At the same time, the NRC is being asked to take on new responsibilities relative to its mission.

In light of this changing environment the Commission is articulating a new vision which will undergird all that we do while tying together new and ongoing initiatives to improve our regulatory processes. It will incorporate three principles which have guided a number of recent initiatives. First, affirming our fundamental health and safety mission, including its national defense and security elements. Second, ensuring regulatory effectiveness, and, third, positioning the NRC for change. I would like to briefly discuss each of these in turn.

The health and safety mission of the NRC encompasses more than reactors and goes beyond initial licensing. Licensing builds safety into the design, construction and initial operation of a new nuclear facility or nuclear activity.

An equally critical part of our mission is the regulatory oversight of operational safety. Ensuring regulatory effectiveness means keeping a primary focus on adequate protection of public health and safety and minimizing risk at reasonable cost as a basis for any new regulation or change to an existing one. It also means considering ease of implementation, consistency with other applicable statutes and regulations and internal guidelines, fairness, and the fit of the regulation into the entire regulatory program. Another important element of regulatory effectiveness is the use of risk analysis insights.

The NRC must position itself to respond to a changing environment. In the United States, change in the nuclear industry is being driven by market forces and competitive pressures to which individual licensees are responding. We believe, as regulators, that nuclear generators of electricity, faced with a competitive market, must provide sufficient resources devoted to nuclear operations to continue to maintain high safety standards and that decommissioning funding assurance must be maintained.

Another potential change to NRC's activities relates to the Department of Energy's intention to develop a High-Level Radioactive Waste Solidification System at Hanford, Washington. DOE has requested NRC involvement in its pilot project to help facilitate the eventual NRC licensing of DOE contractors' facilities. In fiscal year 1997, the NRC will also begin working with DOE on determining the primary and backup approach to tritium production. DOE is also considering an NRC role in the oversight of DOE's nuclear safety activities consistent with the recommendations of the Advi-

sory Committee on External Regulation of Department of Energy Nuclear Safety.

While the NRC does not take a position regarding the desirability of external regulation of DOE nuclear safety activities, we have expressed the view that NRC would be the appropriate agency to perform this role. Such an increase in our regulatory responsibilities would require adequate resources and sufficient time to develop a sound regulatory program.

Against the backdrop of change in our regulatory and fiscal environment, and consistent with the three governing principles outlined earlier, one of my first actions as Chairman of the NRC was to initiate a strategic assessment and rebaselining of the agency. This is necessary to position the NRC to better meet the challenges we face, to guide our activities and decisionmaking in the future, and to systematically incorporate ongoing streamlining and efficiency initiatives.

The first phase involves a review and categorization of each agency activity to see if and how it ties into our statutory mission, Presidential Directives, or Commission policy, or if it has some other rationale for its existence. It is also designed to identify key strategic issues, questions and decision-making points to be addressed by the Commission. This phase is essentially complete.

In the subsequent phases, decisions by the Commission on key strategic issues will form the basis of a new NRC strategic plan. This plan will be responsive to Administration and Congressional objectives to improve efficiency by reducing unnecessary regulatory burden and by improving NRC internal processes. It is intended to bring a comprehensive, agency-wide perspective to our decision-making.

We expect the preliminary results of strategic assessment and rebaselining to be available in early summer, allowing stakeholders to provide input. The final results will form the basis for the fiscal year 1999 budget request. In addition, as results become available, we plan to use them to influence the scope and direction of the fiscal year 1998 budget submission to the greatest extent we can.

The NRC already has initiated or completed a number of activities to reform and improve its operations. Our prepared statement highlights some of the more important activities, together with the Tables in the Appendix.

Our budget request for fiscal year 1997 is $480.3 million. This represents only a $7 million increase over fiscal year 1996 and is less than the projected rate of inflation.

This small increase is being driven by two things. First, as noted earlier, the Agency plans to undertake new responsibilities associated with the Department of Energy beginning in fiscal year 1997. These involve the anticipated commercial vitrification of the High-Level Waste in the Hanford tanks, and commercial tritium production in light-water reactors. Second, we believe it is essential to maintain the technical capabilities the NRC will need for reviewing a license application from DOE for a High-Level Waste repository.

The details of our budget request for fiscal year 1997 have been provided to your Committee. That request is summarized by programs in the chart that accompanies our full testimony.

Since 1993 the NRC has been on a trend of decreasing staff resources. Consistent with direction from this Committee, we have accelerated the planned staff reductions for fiscal year 1997 resulting in a level of 3,120 FTE.

With regard to funding trends, the NRC's fiscal year 1997 budget request reflects an 11 percent reduction when compared to fiscal year 1993. When the effects of inflation are considered this is a 20 percent reduction in buying power.

We are sensitive to the economic burden which NRC fees place on our licensees. The NRC has taken action to allocate the cost of accomplishing it's mission in a fair and equitable way among the broadest base of NRC licensees. Because under current law we cannot charge DOE fees for fiscal year 1997 work, we have included language in our proposed fiscal year 1997 appropriation legislation to exempt the resources for the DOE Hanford tank work from the 100 percent fee requirement. The Commission will continue to work with the Congress toward the objective of making fees as fair and as equitable as possible.

In conclusion, we take very seriously our responsibility to ensure adequate protection of public health and safety in the use of nuclear materials in the United States. We believe that we must make our programmatic decisions based on this responsibility. At the same time, we are sensitive to the need to contain the NRC's costs of doing business. We believe that the resources requested in our fiscal year 1997 budget are necessary to achieve those objectives.

We greatly appreciate the support for NRC's programs which you have afforded to us in the past. We hope to continue to benefit from this support. In the Commission's view, these programs are necessary to ensure effective regulation of industries which touch virtually every facet of American life.

Mr. Chairman, that concludes my statement. My fellow Commissioners and I will be pleased to answer any questions that you and the Committee may have.

Mr. MYERS. Thank you, Chairman Jackson. Your Bio, along with Commissioner Dicus's, will be placed in the record because you're the new members of the Commission. Old timers like you, Commissioner Rogers, we know who you are. Of course, you know who we are too.

Ms. DICUS. Yes.

CHERNOBYL

Mr. MYERS. The primary responsibility, of course, placed on you by this Nation is to provide safe reactors and safe operation of reactors and through the years the Commission's ability to meet that mission has been up and down. I suppose no other Commission has been criticized quite as much as your Nuclear Regulatory Commission by this Subcommittee because we've been unhappy sometimes with the lack of progress. We had a Commission composed of people who are anti-nuclear and it seemed to me you wouldn't want a referee of a professional game to be somebody who didn't like the game. Maybe that's not a good analogy but it just didn't seem like it fit, to have somebody who is totally anti-nuclear who had all the evidence in the world. It was very true that composite of five of

them you had at least three of them who were anti-nuclear so we did go through a period of time. I don't know whether you can blame the fact that our Nation has slipped behind the rest of the world in the use of nuclear energy for fuel but it seems that we have. Of course, we've had one severe setback but not compared to the rest of the world. We still are pretty safe; the operation, thanks partly to the Nuclear Regulatory Commission. But you have visited Chernobyl, or Chernobyl, however you want to pronounce it, last Fall. What was your impression of your visit?

Ms. JACKSON. My visit was a sobering visit. I think that I'll try to divide my response into two categories. One is understanding the reality of the situation for the country, for Ukraine, but at the same time looking at it from the view of the U.S. nuclear safety regulator.

As you know, our Government has been working with Ukraine to secure the closure of the Chernobyl Nuclear Power Plants by the year 2000. My belief, and reinforced by my visit, is that that is the right thing to have happen. At the same time, one is dealing with a situation with Ukraine essentially being a new country since the breakup of the former Soviet Union and, therefore, is trying to put into place a legislative infrastructure. At the time I was there they did not have a Constitution—and were trying to grapple with regulating a nuclear enterprise within that context.

The Chernobyl Plant has been around for a long time. It's designed in a way that is not the way plants in this country have ever been designed. There were any number of things that I observed having to do with the instrumentation in the control room to the existence, or lack thereof, of a radiological safety program. I was asked for dosimeters as I walked around, being taken around by their Radiation Protection staff.

Mr. MYERS. You were asked?

Ms. JACKSON. Yes, I was asked if we could help them get actual dosimeters.

Mr. MYERS. Did you wear them while you were there?

Ms. JACKSON. Of course. We take them from here.

Mr. MYERS. What kind of reading did you get after you left the plant?

Ms. JACKSON. I had a measurable dose.

Mr. MYERS. Did you?

Ms. JACKSON. But it was not something that falls within any zone of concern relative to any health effects. And I think that, you want to know if you got a dose.

Mr. MYERS. Some of us visited there last year and we don't know if we came out with a dose or not. Go on, I'm sorry to interrupt you.

Ms. JACKSON. No, that's fine. So there's various things with respect to the overall design of the plant, its current condition, etc., and I think most people don't appreciate that there are actually four units at the site, two of which were operating.

Mr. MYERS. They had two operating when you were there?

Ms. JACKSON. That's right. And I went to Unit 3, which is the one that's immediately next to the one involved in the accident. That's when I got the measurable dose. But I would just say that overall, the overall physical condition of the plant, the conditions

under which they're operating, etc., make it a very tough situation. I think there have been a number of operational improvements since the time of the Chernobyl accident and I think that the plants figure into the overall production of electricity in that country in a critical way. And so the approach that our Government has been taking to try to resolve the issue, tries to take account of the fact that any plan to shut down Chernobyl has to deal with issues such as replacement power, social costs, etc. It seems that there is essentially the basis of an agreement at this point and I would hope that we can follow through together with the other G–7 nations on securing the closure. What was your impression?

Mr. MYERS. Sloppy. It was a sloppy operation. I'm not at all sure I was satisfied personally with their explanation of what happened there or what caused the accident. I think there may have been more devious activities going on there than they related. The way they described it, they couldn't have made that many mistakes, even if they tried. But the manager there was very definite he wanted to continue to operate it; he felt he could operate. The official position of the new President, of course, the new Administration of Ukraine, as we all know, is to close it by the year 2000. But he was adamant they couldn't close it, couldn't afford to, with both the need for electricity as well as paying for the operation there. Were 2 and 3 operating then, Units 2 and 3?

Ms. JACKSON. That's correct.

Mr. MYERS. I think 1's closed down forever and 4, of course, is capped.

Ms. JACKSON. That's right. One of them had been involved in a serious fire.

Mr. MYERS. Yes.

Ms. JACKSON. About four or five years ago.

Mr. MYERS. In the surrounding community did you have the opportunity to visit any other communities there, the villages?

Ms. JACKSON. I stayed in Slavutich which is the worker village.

Mr. MYERS. Oh did you?

Ms. JACKSON. I, in fact, spent the night there and saw some of the countryside and then went through the Exclusion Zone to the Plant. That in itself was sobering because of the fact that Slavutich is there because of having to move people from the initial worker village of Pripyat and all that that entailed and why that had to happen. I also rode by, or through, Chernobyl itself because there is a town of Chernobyl and it's a ghost town. And, again, all of that is within the 30 kilometer Exclusion Zone. And then we had to stop, and I'm sure you had that experience, to have the vehicle checked as we went from one area to another. It's a big social issue, a big environmental issue and a big safety issue. And so, I'm a big proponent of the shutdown of the plants.

Mr. MYERS. I don't think I'm going to question that but we gave them that day. If you have one more mistake here you've not only done damage to your own reactor, you've closed down nuclear reactors for the world I think, if that happened again. So, we admonished it. For what it's worth, the manager there felt that he had a responsibility to the rest of the world too.

Ms. JACKSON. We always operate on the principle, and I think we all firmly believe, that a nuclear accident anywhere is a nuclear accident everywhere.

Mr. MYERS. There's just no comparison what happened there to what happened at Three Mile Island.

Ms. JACKSON. That is correct. There were no radiological releases of consequence for the public. Nonetheless, we did have a partial core meltdown at Three Mile Island and I think that was a watershed event in the history of nuclear power here and we shouldn't lose sight of the lessons learned.

Mr. MYERS. It was a tragedy, but you know, as far as I'm concerned, it's an asset in our inventory here that we were able to let that happen and still survive with no serious damage other than the physical damage to the plant there. But it proved our systems do work contrary, of course, to design. It was a faulty design which was partly to blame for what happened but if you look back through classified material about what preceded the meltdown at Chernobyl, there's a lot of indication there might have been more going on than they tell us was going on. I still don't trust them.

Ms. JACKSON. Well, my point of view is that even as we make relative comparisons, and there is a big distinction as you point out between Chernobyl and Three Mile Island. One has to, nonetheless, use all learning opportunities to do things in as safe a way as we can, keeping cognizant of the fact that there aren't infinite sources of money.

Mr. MYERS. That's very sure. Did you go on to Russia then, Moscow?

Ms. JACKSON. I've been to Moscow, not on that trip but on an earlier trip.

Mr. MYERS. I have the impression they unloaded that on Ukraine.

Ms. JACKSON. It is true that there is an issue having to deal with the sharing of design information with the countries of the former Soviet Union by the Russian Federation and the lack of that sharing, or the lack of the accessibility, complicates the ability of the countries with nuclear plants to do safety assessments.

Mr. MYERS. I have some other questions which I'll leave for the second round. Mr. Bevill.

Mr. BEVILL. Thank you, Mr. Chairman and I welcome you, Chairman Jackson.

Ms. JACKSON. Thank you.

Mr. BEVILL. And, Mrs. Dicus. I'm delighted to see you, Mr. Rogers.

Mr. ROGERS. Good to be here.

INTERNATIONAL PROGRAM

Mr. BEVILL. While we're talking about Russia, I'm wondering if, with all the know-how that we've gathered in this country, and I say that because I think we probably have the best safety rules and regulations in the country, or in the world I should say. But I'm wondering, are the people over there responding to all of the good advice they're getting from this country as far as safety is concerned after their experience?

Ms. JACKSON. We've been working, Congressman Bevill, very closely with the nuclear safety authority, again, in both the Russian Federation as well as in Ukraine and we have a number of assistance programs that we've carried out primarily through the use of funds from the U.S. AID. We feel that the regulatory framework has been strengthened and that we've helped to enhance safety consciousness, not only within the regulatory context but also within the operational context. But, those efforts continue.

Mr. BEVILL. On the two that you mention there that are operating, did you make any recommendations to them on that, on those two?

Ms. JACKSON. Well, that's an interesting question. The way we operate is the following. We try to stay away from directly telling another country or someone else that your plant needs this, this, and this. What we instead do, is to work with those whose responsibility it is, to make those judgements, to show them how we do safety assessments, how we arrive at what kinds of safety upgrades need to be done and to focus them on the need to do that kind of, take that kind of approach. And we feel that we've been successful in the sense that the regulatory agencies, together with the plants, have done safety assessments. There has been a lot of work on safety upgrades, generally, through the Nuclear Safety Account that is with the European Bank for Reconstruction and Development to do upgrades at plants of the former Soviet Union, and other plants in Central and Eastern Europe. We've had the most, one of the stronger involvements with safety upgrades at a plant in the Czech Republic, the Temelin Plant. Again, working through this kind of methodology and, in fact, the gentleman who came and took part in training courses in our Technical Training Center in Chattanooga, became the head of their regulatory body. And they make a lot of use of our approaches, our regulations, even our regulatory guides, etc. And, that plant is being upgraded with Western technology primarily in fuel design and control systems.

Mr. BEVILL. Yes. In your judgment were those two units, if they had been in the United States, I have an idea they'd have trouble operating.

Ms. JACKSON. That's correct. From our perspective.

NUCLEAR REGULATION

Mr. BEVILL. Now, on the other hand, do you think that we might do better with our regulations insofar as reducing the number of them?

Ms. JACKSON. That's a fair question.

Mr. BEVILL. Do you have anybody working on that?

Ms. JACKSON. Absolutely. As you may know, in 1993, we created a regulatory review group made up of senior level NRC staff, that reviewed selected nuclear power reactor regulations and related processes and they came up with a total of 71 items to be addressed to improve and lift regulatory burden. And 42 of those items, in fact, have been acted on and they've resulted in changes that provide relief in a number of areas, such as requirements related to security. We're looking at the Fitness for Duty Rule and we recently revised our rule on containment leakage testing to become more performance based.

Today, in addition to the ongoing implementation of work from that group, we accelerated what's called our Cost Beneficial Licensing Action Program and that's a program that improves our responsiveness to submittals from licensees where they identify license requirements that have less benefit to safety but cause high economic burden. And at this point, licensees have submitted 272 such licensing actions to us and we've approved 173 of those with a net projected savings to the licensees on the order of $600 million. And then, finally, ongoing is a more comprehensive look at all of our regulations from the point of view of looking at those that we have issued blanket exemptions or numerous exemptions for, to analyze them, to see why we've been doing that and whether, we need to either change, modify or eliminate the regulation. And that is an effort that's ongoing and that will, we think, also result in substantial change and savings, potentially, to licensees.

Mr. BEVILL. During the Carter Administration I met with the Minister of Spain and he was telling me about his plant there—the one plant that they had at that time in Spain, and that they were going to build another one. And, we had built the first one there. I asked him if the United States was going to be building the next one and he pointed to this big stack of regulations. He said there's no way we can comply with all the regulations that your country has placed on its nuclear power plants. And, of course, there's a lot of truth in that we've regulated ourselves out of business. We don't get any applications anymore, do we? Do you have any applications now?

Ms. JACKSON. No, we don't have an active application——

Mr. BEVILL. That's what I said.

Ms. JACKSON. For the construction of a new plant although we recently——

Mr. BEVILL. Of course, this has been several years.

Ms. JACKSON. Right, but we did recently license, give a full power operating license to the Watts Bar Unit 1 Plant.

Mr. BEVILL. Yes.

Ms. JACKSON. It took a long time.

STANDARD REACTOR DESIGNS

Mr. BEVILL. And, of course, the cost is prohibitive. This is one of the problems. This panel has been, for years, urging the Nuclear Regulatory Commission to make every effort to standardize these plants to some extent. We realize you probably shouldn't try to have one but you ought to have, it would be practical, it would seem, to have two designs and bring that cost down and I'm glad to know that you're working on the regulations because that's part of the cost. And at that time the relations between Russia, during the Carter Administration, between Russia and the United States, was not very good. And, so I had to pick it out of him to find out that he was going to let Russia build the next one. That disturbed me because that meant they would be furnishing the fuel and there would be a relationship created there that wouldn't be to our best interest. So when I came back I called President Carter and asked to see him and he set aside a half an hour. So he was kind enough to listen to me for half an hour and then the State Department got involved and to make a long story short, I learned later that one

of our companies in this country did build the plant. I'm concerned about the limitations and all the cost that they're incurring. I think there's a lot of work that you all might do there, a lot of work ahead of you. As President Carter once said, and I quote him because he's the only President we've ever had that knew anything about nuclear with all respect to all the others. I've served with seven and I've liked all of them, frankly. Didn't agree with any of them on everything but he was knowledgeable on that having served on a nuclear submarine, of course. He said actually to do without nuclear power is a luxury our country cannot afford. Of course, right now, you could almost say it's a luxury that we can't afford but we can't afford to keep building them because they've stopped. And so I'm hoping that you work on that because we need it, we need that power.

Ms. JACKSON. Well, as you know, over the last several years we've been doing a number of things along this line. We do have a new streamlined licensing process allowing for a combined construction and operating license to be granted and that was a result of the development of what we called Part 52. And that streamlined licensing regulation, then, references the use of standard reactor designs. We've issued final design approval on two such designs. The ABB/CE System 80 Plus and the GE Advanced Boiling Water Reactor. And we will be certifying, by rule making this year, by the end of the third quarter, we believe, those two designs. And so, we will have then completed the design certification of two standard reactor designs. And the work on two other designs, one a Westinghouse design, the AP 600, continues. And regarding the G design, GE has made a decision relative to their Simplified Boiling Water Reactor. For now, they want a phase out of our continuing review—and we're in the process of doing that—and they've decided to go to another power size.

Mr. BEVILL. You have any judgment how long it'll be before we'll be building new nuclear plants? Any judgment on that?

Ms. JACKSON. I never make absolute predictions because I believe that it's a question of what our energy demands are and what the technology is that would be available at the time and I think having these two standard reactor designs goes a long way to having a new type of design available. And it also depends on public confidence and public trust and that's where we come into play. And it depends on the regulatory process and whether it's inhibiting. We believe that our new process for licensing standard reactor designs is not, should not, be inhibiting. In the meantime, though, we do have an inventory of 110 operating reactors. They are a maturing fleet. Nonetheless, we do have in place a process for extending the license of those plants provided effects can be appropriately dealt with and we think there are at least one or two candidate plants for license extension that we can see in the near term.

Mr. BEVILL. As we country lawyers say, with your excellent knowledge and experience already, do you have any judgment as to when we might get back into the business of producing electricity with new power plants? Ten years, twenty years, thirty years?

Ms. JACKSON. It probably will be beyond my term on the NRC. Beyond that I'm not willing to predict. But we will be expecting a license renewal application in the near term.

Mr. BEVILL. During your new term?

Ms. JACKSON. We think so, yes.

COMMISSION FORMAT

Mr. BEVILL. Well, that's encouraging and that's good. I notice you only have three members. I believe we only had three members last year, didn't we?

Ms. JACKSON. We had four.

Mr. MYERS. We had four at this.

Mr. BEVILL. Well, I like three. You know, for years we sat here and heard the five members testify that, well, how did the vote go on this particular issue? Well, it's three to two, three to two. I told them one day it reminded me of one of my county commissions, there's five of them. A Probate Judge in serious condition in the hospital and the next County Commission meeting somebody suggested, you know we ought to send the Probate Judge a get well message and so they sent him a telegram, wishing you a speedy recovery and all those good things. But the clerk put at the bottom of it: P.S. This resolution passed by a vote of three to two. I told him I thought of that. You remember, Mr. Chairman, every vote was three to two and I think three is better, it works better. And so maybe we'll just let it ride and stay there.

Ms. JACKSON. Well, we work very hard at consensus.

Mr. BEVILL. I can tell you all work together and that's encouraging because this went on for years. Oh, we had all kinds of problems. You know, the Chairman remembers that we, well, it's just hard to get a decision with any unanimity and all the division that occurred and the difference in the approach and all. But I guess those days are behind us now and you all have, the Commission, I think, is in the best hands and doing the best job that we've had.

Ms. JACKSON. Thank you very much. We take our responsibilities seriously.

Mr. BEVILL. Mr. Myers and I can speak with authority on that. But we've been watching it all these years. Thank you, Mr. Chairman. I have some other questions here I'm going to just put in the record.

Mr. MYERS. Who are you to challenge that kind of a statement?

Ms. JACKSON. You notice I didn't say anything.

Mr. MYERS. Mr. Frelinghuysen.

USER FEES

Mr. FRELINGHUYSEN. Good afternoon, Mr. Chairman. Mr. Rogers, it's nice to see you. Ms. Dicus, nice to see you. I have several questions that pertain to the license fees.

Ms. JACKSON. Yes.

Mr. FRELINGHUYSEN. The fee base. Last year, Chairman Sellin testified that in absence of statutory authority to remove costs from the licensee fee base, the Commission would reduce the burden of those costs by spreading them across a broader range of licensees. Has this been accomplished?

Ms. JACKSON. Yes. And I would say there's been a change in equitability in two ways. Overall, we actually reduced the actual fees by $40 million and those fees that relate to more generic activities and are not specifically referenced to a given licensee, we've spread as broadly as possible across the full base of licensees and that amounted to $56 million—substantial amounts.

Mr. FRELINGHUYSEN. Thank you. Relative to overdue license fees, the NRC's Budget Execution Report, August, September 1995, shows that the NRC had 352 licensee accounts that were over 365 days past due, over a year. What are the different types of licensees representing the overdue payments and why are there so many accounts that have not been paid?

Ms. JACKSON. Some of it has to do with our fee billing and the closeout of the activity, say, inspection activity, relative to a given licensee and when that closeout date occurs relative to the actual billing cycle. If I were to be honest with you, I think that we now know, and we are focusing on making some improvements in the communication between what happens in terms of closeout and fees, closing that gap. And we're taking a larger examination at our overall financial management systems in the Agency to improve that. Nonetheless, we have made a reduction. I'd have to supply the specific number to you, for the record, after the fact. But, there is more work to be done in that area.

[CLERK'S NOTE.—The following information was submitted for the record by the Nuclear Regulatory Commission:]

Specifically, with regard to overdue accounts, the 352 delinquent debts over one year old at the end of fiscal year 1995 amounted to about $2 million, or less than one-half of one-percent of the little over $500 million we collected in fees from licensees in FY 1995. So far this fiscal year, this debt has been reduced about twenty-five percent. This delinquent debt is mostly from annual fees charged to small nuclear materials licensees, such as gauge users, doctors, hospitals, radiographers and well loggers. Approximately one-half of the debt was incurred by individuals no longer licensed by NRC. We anticipate that the number of unpaid accounts will continue to be reduced in subsequent years.

Mr. FRELINGHUYSEN. So it's fair to say that the number probably wouldn't be over 350? It might be less?

Ms. JACKSON. I think not.

Mr. FRELINGHUYSEN. Not more though?

Ms. JACKSON. No, I don't think it's more.

Mr. FRELINGHUYSEN. Is a portion of the fees paid by the licensees used to offset revenue not received from those licensees that are delinquent?

Ms. JACKSON. No.

NUCLEAR WASTE FUND

Mr. FRELINGHUYSEN. Relative to the Nuclear Waste Fund, the Department of Energy has publicly stated that its Repository Project has slipped another five years as a result of funding limitations. What is your conservative estimate of when the Department of Energy may be able to submit a complete license application to the NRC under its current program?

Ms. JACKSON. We were recently briefed in a public meeting by Dr. Daniel Dryfuss who, as you know, has responsibility for the Repository Program. And he indicated, at that time, that even with their modified approach where they're looking to make a viability

assessment to the Secretary as of the viability of the use of the Yucca Mountain site for repository, that he, nonetheless, expected to be able to submit a license application to the NRC somewhere in the range of the year 2002. So, we're operating on that basis in terms of our expectation for a license application from the DOE. In addition, we're continuing to work with them with whatever modifications they make to the Repository Program to be sure that if there are any key issues or uncertainties that could potentially affect licensing that we identify those even before the 1998 viability assessments. So that by being proactive in trying to narrow our focus on just those issues having to do with the greatest safety significance for licensing a repository, then we're not in the way but we're carrying out our statutory responsibilities.

NUCLEAR WASTE

Mr. FRELINGHUYSEN. Thank you. The general public doesn't make a differentiation between high-level waste and low-level waste. Could you quantify for me what we have in each of those categories and at how many locations, or are the figures just so staggering?

Ms. JACKSON. Well, I cannot speak as directly to the low-level waste but the amount of spent fuel in high-level waste at this point is on the order of 30,000 metric tons.

Mr. FRELINGHUYSEN. Would you want to speculate on the low-level or is it. . . .

Ms. JACKSON. No, I'd rather provide that for the record.

Mr. FRELINGHUYSEN. Alright, if you'd be kind enough to do that.

[The information follows:]

In 1995, approximately 700,000 ft^3 of low-level waste (LLW) was disposed of at two of the three operating commercial LLW disposal facilities in the U.S. (excluding Envirocare of Utah).

NRC has no requirement for licensees to report to NRC the amount of low-level waste (LLW) generated, placed in storage, or shipped for disposal. Therefore, this information is not readily available to the Agency. In addition, the three operating LLW disposal facilities are licensed by Agreement States. However, some data concerned disposed LLW from the COMPACs is available. Licensees are required to prepare a manifest for LLW shipped for disposal. LLW disposal facilities maintain records of the LLW received for disposal. The U.S. Department of Energy has contracts with the operators of two of the three operating LLW disposal facilities (Barnwell, SC and Hanford, WA) to provide DOE with LLW manifest information. DOE maintains a data base of this information.

Data on LLW disposed of at the Envirocare facility (Clive, Utah) is not maintained by DOE. This waste is normally high volume, low activity waste consisting of radioactively contaminated soil and building debris resulting from remediation and decommissioning activities.

Disposal facility data cannot be used to accurately estimate the amount of LLW generated annually because: (1) volume reduction measures (e.g., compaction and incineration) are used prior to disposal; (2) some generators are storing LLW on site rather than disposing of the waste because of the high cost of disposal; and (3) disposal rates vary from year to year due to a variety of factors, including licensee operations (e.g., reactor refuelings and decommissionings), economics, and changes to LLW disposal facility accessibility.

NRC INVESTIGATIONS/ENFORCEMENT

Mr. FRELINGHUYSEN. In your overall report here. Budget Estimates for Fiscal Year 1997, could you be good enough to comment on investigations and enforcement issues relative to the NRC Office

of Investigations? Is there a certain number of allegations of wrong doing by NRC materials in any given year by licensees?

Ms. JACKSON. We can provide that information for you.

[The information follows:]

During Fiscal Year 1994, escalated enforcement actions were taken based upon findings provided by the NRC Office of Investigations. In Fiscal Year 1995 that number increased to 57.

The percentage of investigations opened by case type for the last 2 fiscal years as follows:

Case type	In fiscal year	
	1994	1995
Harassment and Intimidation	34	41
False Statements	37	27
Violations of License Conditions or the Atomic Energy Act	24	26
Other	5	6

During Fiscal Year 1994, the NRC received 250 allegations of wrongdoing; 181 related reactor licensees and 69 concerning materials licensees. The number of allegations of wrongdoing in Fiscal Year 1995 was 218; 156 related to reactors and 62 concerning other material licensees.

Mr. FRELINGHUYSEN. And, what literally happens? It says here, on page 107, the NRC expects to consider between 120 and 150 material enforcement actions in fiscal year 1997. Can you tell me what actually happens when you take an action? They pay civil penalties. What else do they do? What else occurs?

Ms. JACKSON. In order for us to take enforcement action it requires that we do an investigation relative to whether there's been any violation of our regulations and our Office of Investigations does that. Our Office of Enforcement then assesses the results of that and assesses civil penalties. And the penalty, the actual amount of the penalty, is not just a function of what the actual violation is but what actions the licensee took to be proactive. Perhaps the violation was inadvertent or perhaps it was a self discovered violation. And we have provisions in our regulatory processes to allow for mitigation of the civil penalty depending on those circumstances. And we have various severity levels for violations that also relates to the amount as well as the size of the licensee.

NUCLEAR MATERIALS SAFETY

Mr. FRELINGHUYSEN. This isn't in any way related to this section, but, you visited Chernobyl?

Ms. JACKSON. Yes.

Mr. FRELINGHUYSEN. And, obviously, you are aware of some instances where people have been apprehended with materials that could be used to produce weapons. Is there any involvement of the NRC relative to the identification of those types of materials? Are you involved or are you notified when such people are apprehended?

Ms. JACKSON. We know because we have some responsibilities in the MCP&A area relative to civilian nuclear enterprises, materials, control, protection, and accounting. And we are informed when such apprehensions take place but it's not within our statutory responsibility to do anything one way or the other. But we have been involved in, abroad, with nuclear safety authorities and nuclear

regulatory bodies in sharing information and training them in that kind of methodology as we practice it here.

Mr. FRELINGHUYSEN. Good. Certainly there's a high level of concern out there in the public.

Ms. JACKSON. We've been working very closely with the Department of Energy in efforts they've made relative to physical security and accountability of materials as well as overall safeguards development for these countries where we have these concerns.

Mr. FRELINGHUYSEN. So to a certain extent countries would do themselves and perhaps the world a favor if they duplicated or imitated, to a certain extent, what we have in place?

Ms. JACKSON. I would say we've been propagating our standards.

Mr. FRELINGHUYSEN. Well, thank you very much.

NUCLEAR WASTE FUND

Mr. MYERS. Thank you, Ron. Madam Chair, first off, this magazine. Well, let me get that later. Let me talk a little bit more about the responsibility of nuclear waste. You mentioned Yucca Mountain a moment ago. We all know that we're way behind schedule as far as a legal commitment that the Department of Energy has to start accepting, in 1998, the waste from some of these reactor sites. You have people there now and have had since we started boring the hole, I believe, or have you not?

Ms. JACKSON. We have two inspectors on site.

Mr. MYERS. Would that facilitate, somewhat, to expedite the proceedings once the licensing procedure starts, whether it's 2002. Wouldn't it be a lot easier? It shouldn't take as much time should it?

Ms. JACKSON. Well, our intent in having two people at Yucca Mountain, in fact, is to do just that, to facilitate the overall licensing process—to help in the identification of issues, particularly ones that would relate to licensing. As you know, we separately have capability, both at the NRC and in Texas relative to technical issues. And so we've been focusing on the regulatory issues and on the key technical issues that relate to the licensing of a repository and trying, without influencing or being unduly involved, to stay ahead of the curve so that DOE is well aware from a licensing perspective of what is required. And we think by doing that we're not in the way but actually help to facilitate potential licensing down the line.

Mr. MYERS. Well, this Committee has been quite concerned about the fact we are slipping behind on some, in fact, we're probably ahead on the revised schedule right now.

Ms. JACKSON. Yes.

Mr. MYERS. Originally when it was, back in the early 1990's, we are way behind and we are not going to be able to meet that responsibility. So we've been quite concerned that we are not one to waive any safety measures but to make sure that something's available to start accepting this waste because this article I'm going to ask you about shortly. I'm sure you've examined it. But, it relates to the waste, located at a great many facilities, around 114 I believe, 114 reactors.

Ms. JACKSON. 110.

Mr. MYERS. 110, OK. But it is a real problem to our country and we just hope that we can expedite that and move it along as rap-

idly as possible because it is a real threat, I think, to society, to leave it exposed out there and less secure—we would have if we have a repository developed.

Ms. JACKSON. Well, let me just mention three things that we're trying to do relative to facilitating the licensing of any repository. As I said, by having our people at Yucca Mountain we try to keep the focus on helping DOE understand what are the licensing issues. And part of that is then, second, focusing in on key technical issues, and we've identified 10 of those with the DOE. And we've essentially resolved the methodology for dealing with all but two of those issues. And, third, we are considering a modification of our repository regulation, to be specific to Yucca Mountain. In a way that eventual regulation would be one that protects public health and safety but would be facilitating.

Mr. MYERS. It's a trade off. There's an exposure right now. I don't want to magnify this any more than it already is and so I hear the immediate concern, my God, all that waste out there, these 110 locations, it's a threat to society—it is. But, it's a lot safer when we get a permanent repository. I'm hoping that we can make a decision to reprocess by then so we'll be depositing 3 percent of our waste instead of 100 percent. But, nonetheless, I hope that you'll be able to expedite that rapidly. Are you requesting enough money here or would it be better if you had a bit more money to be prepared for this year 2002, maybe hopefully even before that?

Ms. JACKSON. If we get the money that we are requesting we feel that we can do what we need to do.

Mr. MYERS. You've asked for enough?

Ms. JACKSON. We feel that if we get the money we're requesting we can do what we need to do.

Mr. MYERS. Often those requests are reduced by various people along the lines. I'll ask it differently. Were more money available could you do a better job of being prepared for that year 2000 or 2002?

Ms. JACKSON. We feel that in order to be prepared for that year we need to maintain the capabilities we have primarily at our Center for Nuclear Waste Regulatory Analysis in Texas as well as to support in-house staff efforts on the strictly regulatory side. And we have done an analysis and redone the analysis that suggests that we need a certain amount of funding to keep that Center alive. And, at the risk of appearing to go against the Committee's direction of last year, we felt we——

Mr. MYERS. No one else does, why don't you too?

Ms. JACKSON. But they may try to hide it, I'm not. $13 million for the Center and $4 million for NRC. That Center took us over five years, five to seven years to develop. And so it's a situation of not being able to put Humpty Dumpty back together again so easily. And, that's why what carryover we had from the Waste Fund, coupled with what was appropriated last year, we put to keeping the program viable, coupled with what we're asking for this year and any from the prior year Waste Fund carryover, using it to keep the Center viable. And we think that this is the baseline amount of money.

Mr. MYERS. OK.

Ms. JACKSON. That we need. Now if it gets cut from that, then we have a serious problem.

Mr. MYERS. Well, I'm trying to give you money. You said no, no, I don't want it.

Ms. JACKSON. Well, if you know that it's going to get cut by a certain amount we can always do the reverse calculation.

Mr. MYERS. You just told us how honest you were, so we appreciate that and I'm not suggesting others aren't but we find later on, sometimes, we have been misled. Nonetheless, it's that important to this Committee that we want to make sure we move that repository site to take care of our nuclear waste; otherwise, we're going to be up to here and there's going to be those who are going to say we can't afford the waste so why don't we stop the nuclear fuel. So, I think it's very necessary and this Committee's very——

Ms. JACKSON. We feel if we get the $17 million, Mr. Chairman, that we can keep up with the Repository Program, adjust to any changes that the DOE has, and do the appropriate regulation changes that we need to ensure the progress.

MEDICAL ISOTOPES

Mr. MYERS. Mr. Bevill and I agree but these young people are going to be here and in five years from now you're going to come along and say, well if you'd given us more money we could have been prepared. That's what we don't want. We're trying to save you here, Ron. You know my experience, my wife's experience with cancer. Radioisotopes that have been used, diagnostic work and so forth, you all know that. And this country has fallen way behind. There's been a suggestion by some commission, that maybe you shouldn't regulate the production of the isotopes. But, what are your views on this?

Ms. JACKSON. Well, there's a lot of discussion.

Mr. MYERS. National Academy of Science.

Ms. JACKSON. Right, the National Academy of Sciences, Institute of Medicine Report. Well, as I mentioned in my opening statement, we are doing a strategic assessment and rebaselining where we're looking at everything. And what we are doing is folding the recommendations of the National Academy of Sciences Committee into our evaluation of that issue and looking at how the issue——

Mr. MYERS. Pardon me.

Ms. JACKSON. How the issue joins with our overall Materials Regulatory Program and, at this point, we haven't made a decision. The Commission has not made a decision but it is something that we're going to be focusing on over the next several months to come to some resolution by the end of the year.

Mr. MYERS. What's shocking, you talk to radiologists who say we have to wait sometime, wait for a day or two, to import the——

Ms. JACKSON. Let me mention that there are two concerns to us relative to the Academy report. First there still has to be consistency of standards, we believe, across the country to protect public health and safety. And, therefore, there has to be some mechanism for doing that. Secondly, if this responsibility were going to—to the states, then one should find out from the states to what extent they want it and to what extent they have the capability to take it on.

Mr. MYERS. I'm not sure that's the answer, but I do know when they're produced outside the United States, even Canada seems to be going out of business now or we're getting more out of Europe now. We have lost complete control as far as the quality is concerned of being able to conduct ionized radiation.

Ms. JACKSON. And we're also looking again at our existing regulations for improvement.

MILLSTONE NUCLEAR PLANT

Mr. MYERS. My last question, of course, is this Time article. How do you do with that site, well, that goes back to my question about being able to store the waste at the site as it is today and there are those who say we don't need to have a repository. We continue to need it to maintain authority. What's your quick assessment of this article?

Ms. JACKSON. The quick assessment is the following; one, from the point of view of a national publication that of course many millions of people are going to read, in terms of the actual risk to the public, I would honestly say that the article is somewhat hyperbolic. From the point of view that it shows that there, nonetheless, are lessons to be learned by the NRC in terms of improving our oversight as well as looking at and reinforcing with licensees their responsibilities to adhere to safety requirements, then I think there are lessons learned on both sides. And, we are continuing, as I'm sure you're aware, of fairly extensive examination of practices relative to our requirements at this particular plant, at the Millstone Plant. We are also, in addition, in the spent fuel pool issue, looking across the country at all 110 reactors in terms of their conformance with their final safety analysis reports and licensing bases with respect to spent fuel pools. And, finally, we're looking at the overall issue, taking a vertical slice in selected areas relative to the degree of conformance of licensees with their licensing bases and to what extent those bases exist and can be properly documented, etc. We're also making some internal changes, basically in the area of selection and training with respect to inspectors as well as improving our own guidance to our people. And so the important point is to get to the heart of this particular issue without overreacting, and making the improvements and moving forward. We are taking a nationwide look. But, let me just say that the Time Magazine article was an impetus relative to a particular issue. We've been making regulatory improvements all the time and there are a number of things that I initiated since I've been in NRC that have nothing to do with the Time Magazine article. And the whole point is keeping the appropriate focus on public health and safety but trying to do it in a way that's as effective and fair as possible to those we regulate.

Mr. MYERS. Well I hardly want to turn over the decision making to people who make a living out of selling sensational articles. Well, we thank you for your testimony. Our colleague, John Porter from Illinois, a Member of the Appropriations Committee, has some questions he will provide for the record and all of us have some questions we'd like to provide.

Ms. JACKSON. Yes.

Mr. MYERS. We thank you. Ron, do you have any more questions? We have to go on to try and keep the country running this weekend so we're meeting at 3:00 with the other Body.

Ms. JACKSON. Thank you very much.

Mr. MYERS. And we thank you very much for your questions and your contribution.

[Questions for the record and the answers thereto follow:]

NRC RESOURCES

MR. MYERS: In FY 1996, Congress cut NRC's budget authority $42 million, net of the nuclear waste fund appropriation, from the FY 1995 level. Because NRC is funded totally by fees from the nuclear industry, except for the nuclear waste fund, the industry should benefit from the $42 million reduction in appropriations. Please detail how NRC has passed the $42 million in savings on to the industry through its licensee fee structure? What other opportunities does NRC see for reducing fees to licensees in the future? How would you describe the reaction of licensees to these impacts?

CHAIRMAN JACKSON:

This entire $42 million reduction in appropriations was passed along to NRC's applicants and licensees as savings in the form of reduced fees. Approximately 50 percent of this reduction will be realized in reduced licensing and inspection fees paid by the industry in FY 1996 and the other 50 percent will be in reduced FY 1996 annual fees.

On January 30, 1996, the NRC published, for public comment, a proposed fee rule to recover the FY 1996 appropriations. The NRC received eight comments on the proposed rule. This is the lowest number of comments received on a proposed fee rule, subsequent to the requirement to recover 100 percent of the budget from fees. All commenters supported the steps taken by NRC to stabilize the annual fees noting the reduction in all annual fees. While noting that the NRC has made fees more equitable and fair, the commenters indicated, however, that they continue to believe that 100 percent fee recovery, as mandated by the Omnibus Budget Reconciliation Act of 1990, is unfair and inequitable to licensees because they are paying for NRC costs that are not related to and do not benefit them. They urged the Commission to seek legislative relief from the requirement to recover 100 percent of the appropriations from fees.

One option for reducing fees assessed to licensees in the future is for the Congress to enact the legislative relief suggested by industry in their

comments on the FY 1996 fee rule and recommended by the NRC in its February 1994 report to Congress in response to Energy Policy Act of 1992. The legislative change would permit NRC to recover from fees about 90 percent of its appropriations, less that appropriated from the Nuclear Waste Fund, instead of 100 percent.

MR. MYERS: The FY 1997 budget includes $3.5 million for remediation of high-level waste at Hanford. What is the total estimated cost of this new effort? Also, please provide a cost estimate for your work with DOE on tritium production.

CHAIRMAN JACKSON:

DOE has briefed the NRC staff on plans to privatize two future Hanford tank waste remediation systems (TWRS). These TWRS, which will be constructed on the Hanford reservation, will be designed, owned, and operated by government contractors in two phases. NRC's efforts in support of Phase I (pilot-scale facilities) activities are scheduled from FY 1997 through the expected end of operation in 2011 and expected decommissioning in 2016. NRC's efforts in support of Phase II (full commercial operation) activities are scheduled from FY 2002 through the expected end of operation in FY 2028 and expected decommissioning in FY 2033. NRC's costs range from $2.5 to $4.5 million per year for 37 years.

The NRC estimates that its work with DOE on preapplication issues concerning tritium production will require $0.5 million in FY 1997. In FY 1998 and FY 1999, as the project progresses into the phase where the NRC is involved with review of generic topical reports concerning the production of tritium in commercial light water reactors, the staff estimates it will require approximately $0.7 million each year. Resources for acquisition phase activities will depend on specific options chosen by DOE for tritium production. If commercial light water reactors are used for tritium production, NRC licensing, including safety analysis and environmental review, will be required. As specific options are chosen, NRC and DOE will cooperate in planning and completing these activities in accordance with applicable licensing procedures.

MR. MYERS: In NRC's FY 1996 initial and first quarter base table, NRC said that Congress' reduction of its FY 1996 budget by $52 million was having a disruptive impact on its programs listing 30 principal impacts on specific NRC programs. For each principal impact, how was safety directly impacted with respect to the increased risk that an accident might happen? What quantifiable measurements does NRC have to show how the impacts may cause a decrease in safety? How would NRC rank the impacts from most significant to least significant?

CHAIRMAN JACKSON:

We do not expect the $52 million reduction will inhibit us in the short term from continuing to meet our health and safety mission. Nonetheless, we are reducing our inspection programs which can result in the erosion of our safety oversight of operational activities of licensees. In addition, we are reducing the depth and scope of our research on reactors and other safety issues and the technical expertise provided by contractor support. These reductions also affect our pursuit of initiatives to reform and improve our regulatory operations. In the short term this will likely result in inefficiencies for licensees and applicants, and in the long term, degradation to the agency's infrastructure and diminished government services.

MR. MYERS: How will NRC adjust to the budget reduction impacts described, and still assure that levels of nuclear safety previously achieved will be maintained? Are all the impacts high priority items? If not, why NRC's concern? Why doesn't NRC delay funding the lower priority items and use its carryover to fund the high impact items? How will NRC assure that budget reduction impacts will not put economic burdens on licensees or applicants for licenses? For each NRC program, what were the FTEs and funds associated with the related impact items? Why isn't NRC able to complete the impact items using carryover funds?

CHAIRMAN JACKSON:

In adjusting NRC's budget to accommodate the $52 million reduction, we eliminated lower priority activities. As a result, we do not expect the $52 million reduction will inhibit us in the short term from continuing to meet our health and safety mission. While this reduction, therefore, does not directly impact health and safety in the short term, it could result in eventual degradation of the agency's ability to respond in a timely manner to technical safety issues and inefficiencies for licensees and applicants. The NRC is utilizing approximately $17 million of carryover funds to ensure that projects are not being terminated precipitously, thereby mitigating impacts of the FY 1996 budget reductions. Additionally, some projects which were to be delayed have now not materialized or have been withdrawn. For example, we were advised that applications for the simplified Boiling Water Reactor from General Electric and the Atomic Vapor Laser Isotope Separation pilot plant for the United States Enrichment Corporation were not being submitted at this time.

The table below reflects the FY 1996 budget and appropriations reduction associated with the related impact for each NRC program.

Programs	FY 1996 President's Budget $M	Appropriation Reduction $M	NET $M
Reactor Program	$262.7	$-27.6	$235.1
Nuclear Materials and Nuclear Waste Program	90.8	-15.6	75.2
Management and Support Program	166.8	-8.8	158.0
Inspector General Program	5.5	-0.5	5.0
TOTAL NRC	$525.8	$52.5	$473.3

The strategic assessment and rebaselining will position the NRC to better meet the challenges we face, to guide our activities and decision-making in the future, and to systematically incorporate ongoing streamlining and efficiency initiatives.

MR. MYERS. How many employees did the NRC add to its staff to regulate the two uranium enrichment facilities leased by the Department of Energy to the U.S. Enrichment Corporation? What is the cost of these activities?

CHAIRMAN JACKSON:

The NRC's FY 1996 appropriation and FY 1997 budget request include $1.7 million and 15 FTE for each year to regulate the two uranium enrichment facilities leased by the Department of Energy to the U.S. Enrichment Corporation.

MR. MYERS: In NRC's FY 1996 Energy and Water Development Appropriation Hearings, NRC stated that an unobligated balance of 3 to 5 percent of its budget is sufficient to provide for unanticipated demands under normal circumstances. Five percent of NRC's new budget authority for FYs 1995 and 1996 are $26 and $24 million, respectively. NRC's beginning FY 1995 and 1996 Reports on Budget Execution (Standard Form 133) indicate that NRC's unobligated balances, exclusive of reimbursable work, were $51 million at October 1, 1994, and $60 million at October 1, 1995. Why are NRC's unobligated balances so much higher than $30 million, the amount NRC needs for unanticipated demands? Why is the unobligated balance going upward rather than downward?

CHAIRMAN JACKSON:

Excluding reimbursable work, the NRC's unobligated carryover was $51 million in FY 1994 and $52 million in FY 1995 -- it is essentially unchanged in the past two years. Over the past few years, we have made a concerted effort to increase the effectiveness and efficiency of program financing by eliminating unnecessary financial reserves pending contract closeout, recovering funds on dormant contracts, mitigating the rate of rent increases, exercising closer scrutiny of the need for planned projects, and more closely monitoring obligation and expenditure rates. The positive aspect of these efforts is that they represent prudent financial management; however, the result is a

higher than normal level of unobligated carryover in the short term. Additionally, some program requirements have changed or not materialized for reasons beyond our control.

In recognition of our fiscal responsibility, the NRC has taken actions to reduce the level of unobligated balances in an orderly manner. Specifically, we suggested a rescission during FY 1994, which the Congress enacted. We suggested a reduction to our proposed FY 1995 appropriation, which Congress also enacted. We are using FY 1995 unobligated balances to facilitate the transition to a lower level of funding in FY 1996 while still permitting the Agency to adequately fulfill our public health and safety mission. Good financial management and expenditure of funds on only sound program needs will continue to be our guiding principles. We intend to aggressively pursue further improvements that are needed to ensure that NRC's financial management is sound such as better forward planning and budgeting.

MR. MYERS: NRC's Apportionment and Reapportionment Schedule (Standard Form 132), dated 11/17/95, shows $59 million and $850,000 for "Salaries and Expenses" and "Office of Inspector General" appropriations, respectively, brought forward as an estimate for "Unobligated balances" as of October 1, 1995. Why are the amounts shown as estimates at October 1, 1995, when the Standard Form 132s were signed at least 1 1/2 months after the fiscal year began? Why does it take NRC so long to determine the actual amounts of "unobligated balances" on these forms that are brought forward? Why are the amounts shown as estimates when NRC's Reports on Budget Execution show the amounts as actual?

CHAIRMAN JACKSON:

After the fiscal year ends, the NRC conducts an intensive reconciliation process to ensure that appropriate financial transactions have been properly posted in the agency's accounting system. That reconciliation process involves all of the agency's allowance holders as well as staff from the Office of the Controller. The result of that process was the final FY 1995 Report on Budget Execution submitted to the Treasury on November 20, 1995.

Prior to that date, the NRC submitted its Apportionment and Reapportionment Schedule to OMB on November 17, 1995. Submission of the Apportionment and Reapportionment Schedule on November 17, 1995, was time critical since approval of our apportionment request by OMB was required before the NRC could obligate the funds provided by the FY 1996 Energy and Water Development Appropriations. As a matter of policy, the NRC provides estimates of unobligated balances on the Apportionment and Reapportionment Schedule until the Report on Budget Execution is submitted to Treasury.

MR. MYERS: Why did NRC's unobligated balance rise so much from FY 1994 to FY 1995? Why such a large increase compared to the $41 million estimate NRC gave GAO?

CHAIRMAN JACKSON:

The NRC's unobligated balance at the end of FY 1994 was $51 million and at the end of FY 1995 it was $52 million. The increase of $11 million from the $41 million projection in March 1995 to $52 million at the end of the fiscal year is primarily due to the recovery of more prior fiscal year funds than anticipated.

MR. MYERS: Chairman Jackson's October 5, 1995, memorandum approved the Executive Director of Operations' September 1, 1995, plan to use carryover funds as transition funding until the Congress appropriated NRC's FY 1996 appropriation. Were any carryover funds used to fund any shortfalls in salaries and benefits? If so, how much of the carryover was used? Were any projects terminated precipitously due to the FY 1996 budget reductions? If so, which projects were terminated? Once NRC received its appropriation in November 1995 for FY 1996, why wasn't a rescission done to reduce the amount of carryover NRC needed for the remainder of FY 1996?

CHAIRMAN JACKSON:

We have used approximately $0.4 million of unobligated high-level waste carryover to fund an anticipated shortfall in high-level waste salaries and benefits. The NRC did not request a rescission since we were planning to use approximately $17 million of the agency's carryover funds of $52 million to ensure that projects would not be terminated precipitously due to the FY 1996 budget reduction. An additional $7 million was committed to FY 1995 projects which were not obligated until after the end of the fiscal year. The remainder would be available to provide for any unanticipated needs throughout the year.

MR. MYERS: NRC's Report on Budget Execution for the period ended 6/30/95 showed that $737,588 was anticipated to be recovered from prior year obligations from 7/1/95 through 9/30/95. The actual amount of funds recovered was $9,381,039. Why wasn't NRC able to more closely match the anticipated amount of recovered funds considering that only three months separated the reports? Why didn't NRC request a rescission of the $9.8 million since the funds were unanticipated?

CHAIRMAN JACKSON:

The anticipated recoveries on the Report on Budget Execution are based on a calculation of estimated recoveries from the Apportionment and Reapportionment Schedule minus actual recoveries to date. Although, the NRC realized there would be a larger recovery than shown on the Report on Budget Execution as of June 30, 1995, the staff NRC did not increase the estimate on the Apportionment and Reapportionment Schedule to show the higher anticipated recoveries since they did not anticipate an immediate need for this authority. The NRC did not request a rescission since we were planning to use approximately one-third of the agency's $52 million carryover funds, to ensure that projects would not be terminated precipitously due to the FY 1996 budget reduction. An additional $7 million was committed to FY 1995 projects which were not obligated until after the end of the fiscal year. The remainder would be available to provide for any unanticipated needs throughout the year.

MR. MYERS: NRC has been receiving no year appropriations since before 1990. By fiscal years, what are the amounts of new budget authority, obligations, and unliquidated obligations at the end of FY 1995?

CHAIRMAN JACKSON:

I will provide that information for the record. (The following tables were provided).

Fiscal Year	New Budget Authority	Obligations
1991	$465.0	$460.9
1992	$512.5	$513.1
1993	$540.0	$522.7
1994	$535.0	$531.6
1995	$523.9	$540.0

The majority of the unliquidated obligations at the end of FY 1995 are from obligations occuring in FY 1995. This is as expected because these dollars were the lastest to be obligated and as yet have not been expended.

Fiscal Year	Unliquidated Obligations at end of FY95
1990 and Prior	$1.4
1991	$0.8
1992	$2.0
1993	$5.4
1994	$22.0
1995	$107.4
Total:	$139.0

Notes:
Dollars in millions.
Data as of 9/30/95.
Excludes reimbursable work.
Includes accrued expenses.

DECOMMISSIONING

MR. MYERS: Please report on the Commission's progress in developing with EPA the Radiation Site Cleanup Regulation (40 CFR 196) and Radiological Criteria for Decommissioning (10 CFR 20). Briefly describe how these will be applied to the Environmental Management program of the Department of Energy.

CHAIRMAN JACKSON:

NRC proposed its radiological criteria for decommissioning rule (10 CFR 20) in August 1994. Since then we have been reviewing public comments on the rulemaking, conducting additional assessments of the costs and benefits of the rule, coordinating the regulations with EPA, and developing technical guidance that would be required to implement the rule.

EPA has developed a draft proposed rule on cleanup standards (40 CFR 196), which is currently under review by the Office of Management and Budget (OMB). The proposed rule is similar in most respects to NRC's proposed rule. NRC has reviewed an earlier version of the draft proposed EPA standards and is developing comments to discuss with OMB.

The staff is planning to consult with the Commission in April on the schedule for completion of NRC's rule. The two principal options are to wait until after completion of EPA's standards or proceed to complete the Part 20 requirements at this time.

There has been extensive cooperation between NRC and EPA in developing the two rules. Several issues remain to be resolved, however, between the agencies. These include: (1) the need for the separate groundwater protection limit which EPA desires, (2) alternative standards when compliance with an established dose limit is not feasible, and (3) implementing requirements for the dose standards, including provisions for allowing restricted release of facilities after cleanup.

EPA's proposed standards would apply to the remediation of sites under DOE's Environmental Management Program. NRC does not regulate DOE's remediation program. Thus, NRC's requirements will not apply to DOE remediation.

MR. MYERS: Decommissioning plans are currently approved on a case-by-case basis using technical guidelines. Is this the most cost-effective, and efficient way to conduct decommissioning activities? Is the NRC looking at alternatives?

CHAIRMAN JACKSON:

Efficiency and certainty in the decommissioning process can be improved by establishing radiological criteria standards. This is the reason why NRC initiated the development of the radiological criteria rulemaking in 1993.

Case-by-case evaluations, however, offer flexibility to determine optimal approaches to ensure protection of the public and the environment.

NRC's existing regulations do not require submission of decommissioning plans for NRC review, except for larger, more complicated decommissioning projects. NRC's requirements in 10 CFR Part 50 require power reactor and non-power reactor licensees to submit proposed decommissioning plans for NRC review. In July 1995, NRC proposed revisions to these regulations that would eliminate the requirement for submission for NRC review of decommissioning plans for power reactors. In place of the decommissioning plans, the proposed rule would require licensees to submit a Post Shutdown Activities Report for information, rather than formal NRC review. The proposed rule would not affect current requirements for submission of decommissioning plans at non-power reactors (test, research, and experimental reactors).

For nuclear materials licensees other than independent spent fuel and high-level waste storage facilities, NRC's existing regulations only require submission of decommissioning plans for NRC review if one is required as a condition of the license or if the decommissioning procedures and activities have not been previously approved by the Commission and these procedures could increase potential health and safety impacts to workers or to the public. NRC

regulations in 10 CFR Parts 30, 40, and 70, identify specific examples for when submission of decommissioning plans is required, such as when decommissioning procedures involve techniques not applied routinely during cleanup or maintenance operations. NRC requires licensees to submit decommissioning plans for independent spent fuel and high-level waste storage facilities.

Most decommissioning of nuclear materials facilities (by number) is conducted without the benefit of an NRC approved decommissioning plan. For most small NRC materials licensees, decommissioning is accomplished by transferring long-lived radioactive material such as sealed sources to an authorized recipient and by the natural decay of short-lived isotopes such as most medical diagnostic tracers.

NRC is considering significant issues and alternatives to the existing decommissioning program as part of Strategic Assessment.

EXTERNAL REGULATION OF DOE

MR. MYERS: The Advisory Committee on External Regulation of Department of Energy Nuclear Safety recommended that DOE have external oversight but failed to identify an appropriate oversight organization. Have you reviewed this report? Can you comment on the capability of NRC to provide that oversight?

CHAIRMAN JACKSON:

Yes, NRC has reviewed this report. If the criteria identified in Chapter V of the report are the ones to be used in determining which organization should be the external safety regulator, we believe that NRC is the most capable to respond and would be the appropriate choice. While NRC has not actively pursued the added responsibility of being the external regulator of DOE, NRC stands ready to serve in this function if called upon provided we receive adequate resources and are allowed sufficient time to develop a sound regulatory program.

STRATEGIC PLANNING

MR. MYERS: Briefly describe the "rebaselining" you are doing as part of your strategic reassessment. You said you are almost done cataloguing each agency activity. Do you have any examples of activities you feel can be eliminated?

CHAIRMAN JACKSON:

In Phase I of the Strategic Assessment and Rebaselining initiative we categorized approximately 4,500 activities into agency lines of business and functions. In general, functions are "what" we do and the lines of business are "for whom" we perform the functions. The next step was a strategic review and the development of issues whose resolution will influence the future direction of the NRC. This future direction, or rebaselining, will involve how activities and programs should be changed, added, or eliminated and will address appropriate resource levels. We are not far enough along in the process to identify activities or programs that need to be changed, added, or eliminated.

MR. MYERS: NRC has begun an internal, multi-phased "strategic assessment" process. Please provide the subcommittee with a status report on NRC's strategic assessment process, including the dates for which each of the various phases will be completed. When will the subcommittee see the effects on budgetary expectations resulting from NRC's strategic planning efforts? Given that NRC's current 5 year plan (FYs 1995-1999) may not be accurate in light of its ongoing strategic planning effort, what long range planning document is now driving the agency's activities?

CHAIRMAN JACKSON:

Phase I, the Strategic Assessment Phase, is very near completion and is the first of four phases. The assessment used a bottom-up approach to identify, review and assess agency functions performed and examine the sources of the mandates that make up our regulatory mission. The assessment also included

consideration of internal and external drivers that influence these functions and issues that are expected to be factors in the future. Phase II, estimated to be completed by the Fall of 1996 will address strategic issues that will affect NRC's management and regulatory philosophy and principles and will also form the platform for the Strategic Plan. Development of the Strategic Plan is Phase III and is estimated to be completed prior to the end of the calendar year. Phase IV, Implementation, will be the execution of Commission decisions on charting a path for the agency into the 21st century. This phase will begin with Commission guidance on the direction-setting issues and continue into 1997.

The preliminary and final decisions on the direction-setting issues will be examined to ensure that the FY 1998 budget development stays consistent with the developing strategic direction. Therefore, the subcommittee can expect to see the influence of the strategic initiative in the submission of the FY 1998 budget. The FY 1999 budget will be driven by the Strategic Plan and the agency's Performance Plan.

NUCLEAR WASTE FUND

MR. MYERS: In a February 1996, letter to the Secretary of Energy the Nuclear Waste Technical Review Board stated that the Board believes that if DOE can maintain its current pace of underground tunneling and investigation, then sufficient information will be available within 5 years to make an assessment of whether Yucca Mountain is suitable for a repository. What is the difference between DOE's viability assessment and the statutory requirement that the Secretary of Energy determine the site is suitable for license application purposes?

CHAIRMAN JACKSON:

DOE has informed us that the viability assessment is a DOE decision making process, a DOE statement to clarify the most uncertain aspects of geologic disposal at Yucca Mountain and give sufficient financial and technical data to

allow the Congress to decide whether to continue the program to repository licensing and construction.

The viability assessment will only include four elements:

- Reference repository and waste package design
- Total System Performance Assessment
- Cost for preparing a license application
- Cost and schedule for repository construction and operation

The site suitability determination by the Secretary of Energy is provided for in the DOE Siting Guidelines in 10 CFR Part 960 developed by DOE for use by the Secretary in evaluating the suitability of sites for the development of a repository. Under 10 CFR Part 960, the site suitability evaluation would be carried out in connection with any recommendation by the Secretary of Energy for the Yucca Mountain site for development of a repository. Further, it would be based on making a sequence of high-level findings for the qualifying and disqualifying conditions of the Siting Guidelines.

MR. MYERS: Is there a requirement in the legislation that DOE make a viability assessment? If not, what is the significance of DOE's proposed viability assessment in 1998? In your judgement, will DOE's proposed recommendation to the President in 1998 on the viability of the Yucca Mountain site meet the requirements of Nuclear Waste Act of 1982, as amended?

CHAIRMAN JACKSON:

There is no statutory requirement for DOE's viability assessment.

DOE has informed our staff that the viability assessment will document DOE's understanding of the repository design and its performance in the geologic setting of Yucca Mountain, identify remaining work needed to prepare a license application, and provide an estimate of the cost of a repository to allow Congress to decide whether to continue the program.

DOE's proposed finding to the President in 1998 on the viability of the Yucca Mountain site will not satisfy all of the requirements of the Nuclear Waste Policy Act of 1982, as amended. The viability assessment as we understand it will not be accompanied by an Environmental Impact Statement, a recommendation to the President, the views of the State entities and Indian Tribes, or the preliminary comments of the Commission as required by Section 114 of the NWPA. Whether the four elements that would be included in the viability assessment would be sufficient to support the Secretary's Section 114 recommendation is a question that we cannot answer for DOE.

MR. MYERS: The Nuclear Waste Policy Act of 1982, as amended, requires that DOE's recommendation to the President for a repository site be accompanied by an environmental impact statement (EIS). DOE has recently decided to defer doing an EIS of Yucca Mountain. How does this impact NRC's view on when DOE will ultimately have the ability to recommend selection of a repository site and submit a complete license application? To mirror the DOE actions, should the NRC stop its EIS-related work?

CHAIRMAN JACKSON:

Our most recent information from DOE indicates that they plan to complete a draft EIS by August 1999 and a final EIS by August 2000. Since current plans indicate that the recommendation to the President will occur in July 2001, the EIS should be available for this recommendation.

NRC currently has no resources budgeted to do EIS-related work in FY 1996 or FY 1997.

MR. MYERS: In view of DOE's significantly reduced budget and current plans, does NRC really need to maintain its current level of nuclear waste program infrastructure? Is there concern that these NRC employees could lose their "arms-length" role through years of working with DOE?

CHAIRMAN JACKSON:

We believe that NRC needs to maintain its current level of nuclear waste program infrastructure. NRC has already made significant reductions in its program and is limiting activities to focus on the key technical issues significant for licensing. Other activities necessary for licensing have been deferred. In addition, NRC has significant statutory responsibilities which are independent of DOE's program including the development of specific regulations for Yucca Mountain which are consistent with National Academy of Sciences recommendations and EPA standards.

If the current level of nuclear waste program infrastructure is not maintained during this period of prelicensing consultation, NRC would not be able to address all of the technical issues currently identified as most important to repository safety. However, during the licensing phase, all licensing issues must be adequately addressed. If the NRC waits until the licensing phase to raise significant site characterization questions to DOE, additional costs would be incurred for site characterization and the licensing process could be significantly delayed.

Further, this is a first-of-a-kind facility that requires unique regulatory capabilities. For example, mining engineers, earth scientists, and unsaturated-zone groundwater hydrologists have unique expertise that is essential to the high-level waste (HLW) program. Staff with the ability to conduct performance assessment calculations over large temporal and spacial scales are likewise unique and essential. It requires experienced staff and consultants to adequately regulate this unique program and such experienced personnel are not readily available in the private sector. A majority of the personnel with this experience currently either work for DOE or the NRC and it would require several years to train a newly hired individual. It has taken 10 years to create the center and arrive at its present level of expertise and infrastructure.

The NRC is sensitive in all of its regulatory programs that its employees maintain a proper regulatory perspective with a potential licensee (sometimes referred to as an "arms-length" role). NRC has established, in 10 CFR 0,

standards of conduct designed, in part, to ensure impartiality. In the HLW program, On-Site Representatives are rotated every five years. In addition, management controls are in place which ensure appropriate communication and interaction between representatives of all interested parties.

MR. MYERS: In FY 1996, Congress reduced the nuclear waste program appropriation to $11 million. Rather than adjusting spending to the new appropriation, the NRC plans to supplement the $11 million with $6 million from prior year carryover funds. Why isn't the NRC reducing the program as Congress intended?

CHAIRMAN JACKSON:

The NRC is utilizing $11 million appropriated in FY 1996 from the Nuclear Waste Fund and $6 million appropriated to NRC from the Nuclear Waste Fund from prior years to keep pace with the DOE high-level waste program. This resource level is necessary to address key technical issues related to safety associated with licensing the repository, to interact with the Environmental Protection Agency in the development of high-level waste standards, and to conduct evaluations in an environment free from potential conflict of interest. NRC's activities require the multi-disciplinary regulatory and technical knowledge and experience of the staff complemented by specialized in-depth technical expertise of the Center for Nuclear Waste Regulatory Analyses (CNWRA) to meet the needs of this first-of-a-kind programmatic responsibility. Because of unique issues to be addressed, CNWRA field and laboratory facilities are needed to independently evaluate unique technical issues. Thus, the NRC needs to expend approximately $17 million in FY 1996.

The NRC has reduced its high-level waste program from the $22 million that was appropriated in FY 1995 by making significant reductions in its program and limiting activities to focus on the key technical issues significant for licensing. Other activities necessary for licensing have been deferred. The $14 million requested for FY 1997 and $3 million of Nuclear Waste Fund prior year monies will allow us to maintain the current level of effort. If this level is not sustained, it may jeopardize licensing and additional costs could be incurred for site characterization.

MR. MYERS: NRC financial records indicate that it only had $3.7 million in carryover funds in the nuclear waste program at the beginning of FY 1996. From which programs does NRC plan to take the additional $2.3 million in carryover funds for the nuclear waste program? Specifically, on a line-by-line basis, how is NRC adjusting to the lower level of funding? How would NRC adjust to this lower level of funding if it does not use carryover funds to increase spending in the nuclear waste area?

CHAIRMAN JACKSON:

The NRC has $6 million of available prior year funds which were appropriated from the Nuclear Waste Fund. Of this $6 million, $3.7 million is unobligated carryover and $2.3 million was previously obligated but not expended. Thus, the NRC is not reducing any of its other programs to fund it's high-level waste activities in FY 1996.

The NRC has defined what it considers to be a minimal high-level waste program at $17 million per year in fiscal years 1996 and 1997. We have requested $14 million in FY 1997 and the remaining $3 million will be provided from prior year funds. NRC has already made significant reductions in its program and is limiting activities to focus on ten key technical issues significant for licensing. Other activities necessary for licensing have been deferred.

If the NRC were not able to use prior year Nuclear Waste Fund monies to conduct its FY 1996 high-level waste activities, the fundamental regulatory approach used by the NRC in the high-level waste arena would need to be completely reevaluated. At a minimum, an $11 million total funding level for FY 1996 would call into question the agency's ability to keep pace with the nation's high-level waste program.

MR. MYERS: A significant portion of NRC's nuclear waste funds is consumed by the Center for Nuclear Waste Regulatory Analyses (CNWRA). Presumably, a reduction in the appropriation for the nuclear waste program will require a reduction in CNWRA's activities, e.g., reductions in personnel, computer purchases and software

development, travel, subcontracting, etc. What is NRC's most recent budget for CNWRA? How is NRC reflecting the $11 million decrease in funds for high level waste at CNWRA? Are there any restrictions on NRC reducing CNWRA's budget? If so, what are they?

CHAIRMAN JACKSON:

The FY 1996 appropriation of $11 million for the high-level waste program is being supplemented with approximately $6 million of available prior year high-level waste funds to enable NRC to keep pace with the DOE high-level waste program, to address key technical issues associated with licensing the repository, to interact with EPA and establish a regulatory framework consistent with EPA standards, and to conduct evaluations in an environment free from potential conflicts of interest. NRC has allocated $13 million of the $17 million for technical assistance support from the CNWRA.

For FY 1997 NRC has requested $14 million for the high-level waste program. We are planning to supplement this amount by approximately $3 million of anticipated prior year high-level waste funds to enable NRC to maintain the high-level waste program at $17 million. NRC plans to allocate $13 million of the $17 million for technical assistance support from the CNWRA. This reduces the Center's core professional staff from 54 to 46 FTE's and reduces funds available for other programmatic assistance.

There are no restrictions on reducing CNWRA's budget. However, NRC, as the sole sponsor of the CNWRA, believes it necessary to ensure reasonable continuity in the level of support to the CNWRA, consistent with the Agency's need for the federally funded research and development center and the technical expertise and independence it provides. The scope and depth of technical expertise that NRC believes must be maintained at the CNWRA, requires the funding proposed.

MEDICAL ISOTOPES

MR. MYERS: What role, if any, is the Commission playing in the Department of Energy's efforts to develop a reliable domestic source of Molybdenum 99?

CHAIRMAN JACKSON:

In a May 13, 1994 letter, the Commission strongly endorsed prompt direct action by DOE to ensure the availability of a second source of Molybdenum 99 and other medical isotopes. In addition, information was provided regarding the background of the issue and the projections for needs within the medical community in the United States. NRC recently has had discussions with a commercial entity regarding the licensing process to become a commercial producer of reactor-produced radioisotopes under a facility lease agreement with DOE.

MR. MYERS: NRC regulates only about 10 percent of all ionizing radiation used in medicine. A recent study by the National Academy of Sciences (NAS), requested by the NRC, recommended that Congress eliminate all aspects of NRC's medical use program. Has NRC decided to accept the NAS recommendation to eliminate all aspects of NRC's medical use program? What would be the savings in FTE's and dollars if NRC implements the NAS recommendation? Are there any detriments to public health and safety if NRC stopped regulating this area? Who will regulate medical uses if there is no federal requirement? What will induce states that are not currently agreement states to regulate medical uses at the level currently required by the federal government?

CHAIRMAN JACKSON:

NRC is currently evaluating the NAS recommendations as part of its overall strategic assessment and rebaselining. The NAS report recommends that the states have the responsibility for regulating medical uses with the federal government having a guidance role. A decision has not yet been made with

regard to accepting or rejecting the NAS recommendations. The NRC's medical use program accounts for about 1 percent of the total NRC budget. While some of the resources currently budgeted could be saved, the extent of the savings will depend upon the extent to which the recommendations might be accepted, and the responsibilities, such as the regulation of the production and distribution of byproduct materials, which NAS recommends remain under NRC jurisdiction. Such savings would not be recognized for several years due to the need for rulemakings and the orderly transition recommended by the NAS. The benefits and detriments to public health and safety are part of the ongoing evaluation, and would depend upon the approach taken and the degree to which the responsibilities could be and/or would be assumed by the states or another federal agency. The NAS report suggests the incentive for states to regulate medical uses could be the requirement for users to have a license in order to receive byproduct materials from a manufacturer. The presence or absence of other inducements is part of our ongoing evaluation.

MILLSTONE NUCLEAR PLANT

MR. MYERS: The March 4, 1996 issue of *TIME* featured a front page article describing safety issues at the Millstone Unit 1 nuclear plant in Waterford, Connecticut. The article detailed the efforts of two senior engineers at the Northeast Utilities plant who, in 1992, attempted to report and correct what they felt were severe safety violations. After considerable time and effort, the NRC found merit in the concerns and ordered a massive review of the plant. Please provide the status of the review at Millstone. Following are several areas of concern. Please respond to each individually. Also, please identify claims in the article which are untrue.

CHAIRMAN JACKSON:

The NRC found merit in several of the concerns raised in the TIME article and has taken several actions to address them. Upon learning of the concerns associated with Millstone and prior to the Time magazine article, I tasked the staff to perform a lessons-learned study based on the events at Millstone. I

intend to ensure that areas for improvement in our inspection and oversight process as well as our senior management process for identifying "Watch List" plants are carefully examined.

NRC has taken the following specific actions relative to Millstone plants.

A senior NRC regional manager has been assigned to oversee the NRC's monitoring of Millstone operations. Similarly, at NRC Headquarters, a senior manager has been assigned licensing responsibility solely for the NU plants. Additionally, NRC increased the number of resident inspectors at the station from five to six.

An evaluation of the history of the licensee's and staff's handling of employee concerns and allegations related to licensed activities at Millstone station is being lead by a senior Headquarters manager. The review includes indepth case studies of selected employee concerns and allegations to identify root causes, common patterns between cases and lessons learned.

In a letter dated December 13, 1995, the NRC requested that, prior to restart, the licensee describe the actions taken to ensure that future operation of Millstone Unit 1 will be conducted in accordance with the terms and conditions of the Millstone Unit 1 operating license; the Commission's regulations, including 10 CFR 50.59; and the Millstone Unit 1 Updated Final Safety Analysis Report (UFSAR). Similarly, in March 1996 the NRC issued two letters to NU for Millstone Units 2 and 3 and the Haddam Neck plants requesting additional information. The NRC staff issued these latest letters after it reviewed a licensee internal report on the Millstone Unit 1 UFSAR inaccuracies and considered recent NRC inspection findings.

At the January 1996 Senior Management Meeting, the Millstone Nuclear Power Station was discussed. The Millstone Nuclear Power Station was designated as a Category 2 plant. Plants in this category have been identified as having weaknesses that warrant increased NRC attention until the licensee demonstrates a period of improved performance.

In February 1996, the NRC informed NU that a special team inspection would be conducted at Millstone to evaluate the methods and processes that NU had employed to handle degraded and potentially nonconforming plant conditions, including issues affecting the operability of plant equipment. This effort originally focused on Millstone Unit 1, and has now been expanded to include Units 2 and 3 and the Haddam Neck facility.

The IG has six ongoing investigations regarding the staff's handling of Millstone. We will factor the results of those investigations into our decision making.

Millstone lessons learned have implications for other licensed facilities. NRC has taken the following short term generic actions to address these implications.

The staff is conducting inspections of spent fuel pool licensing bases related to refueling practices at all operating nuclear power plants. The staff is reviewing the adequacy of our regulatory guidance for changes made to facilities and their operations to ensure that future operations are conducted in accordance with regulations governing the changes made without prior staff approval.

Efforts are underway to develop new inspection guidance intended to ensure that licensees are in compliance with and are operating in accordance with their Updated Safety Analysis Reports.

I have also directed the staff to improve the outreach to the public located in the vicinity of the NRC licensed facilities. The staff recognizes the value of public meetings as a means to enhance the public's confidence in the NRC and help clarify concerns before any staff decisions are made. Improved criteria have been developed to aid the staff in decisions to hold public meetings.

The staff reviewed the TIME article and identified eight factual statements of concern which were either inaccurate or misleading. The statements of concern and the staff responses to them are included for the record.

Staff Response to Certain Statements in
TIME Magazine Article

1. Concern: "If the system failed, the pool could boil, turning the plant into a lethal sauna of radioactive steam." (Page 47, Paragraph 2)

   Response: Although not preferred, boiling can be an acceptable method of cooling irradiated fuel in the spent fuel pool under certain unlikely conditions, but the normal and, at some plants, backup cooling systems provide the primary means of cooling. The NRC and many licensees have evaluated the consequences of boiling, and concluded that boiling in unlikely and the consequences are very small.

2. Concern: "And if earthquake, human error or mechanical failure drained the pool, the results could be catastrophic: a meltdown of multiple cores taking place outside the reactor containment, releasing massive amounts of radiation and rendering hundreds of square miles uninhabitable." (Page 47, Paragraph 2)

   Response: The NRC has required licensees to evaluate seismic capability of their spent fuel pools and to provide protection, such as antisyphoning devices, against human errors and postulated mechanical failure which could drain the pool. These requirements make the possibility of draining the spent fuel pool remote. However, in order to fully understand the potential consequences of such an event the NRC studied a spectrum of rare events that had the potential to affect stored fuel in a 1989 report (NUREG-1353, "Beyond Design Basis Accidents in Spent Fuel Pools"). Based on its evaluation, NRC concluded in NUREG-1353 that the modifications to spent fuel pool systems considered in the analyses did not meet the Commission's backfit criteria and were not warranted.

3. Concern: "The NRC says the practice (full core off-loads) is common, and safe - if a plant's system is designed to handle the heat load. Millstone's wasn't." (Page 48, Column 2, Paragraph 1)

Response: The current spent fuel pool cooling system at Millstone is fully capable of removing heat and maintaining the pool temperature within design limits for full core offloads assuming a single failure of any cooling pump. The licensing basis for Millstone 1 did not include a full core offload as a normal refueling activity. Conducting a full core offload as a routine activity is a potential violation of NRC requirements. NRC's enforcement review of this issue is continuing. During the past refuelings at Millstone 1 under actual conditions of heat load and heat removal capability a question exists as to the maximum fuel pool temperature assuming a single failure.

4. Concern: "And when Galatis learned that plants in Delaware, Nebraska and New Jersey had similar fuel pool troubles, he realized that the NRC was sitting on a nationwide safety problem." (Page 48, Column 2, Paragraph 1)

Response: When older plants were licensed, the NRC staff expected full core off-loads would occur only a few times in the life of a plant rather than at each refueling outage. Full core offloads under certain conditions for these plants were reviewed and approved during initial licensing. Newer plants have been evaluated and approved for full core offload as a normal refueling practice. As a result of Mr. Galatis' issue, the staff has informed licensees (Information Notice 95-54) that refueling activities must be in accordance with the plants' Final Safety Analysis Report and that any proposed changes need to be justified as not creating an unreviewed safety question or that those changes be submitted, reviewed, and approved by NRC. In addition,

the staff has initiated a review of all licensee spent fuel pool designs and refueling practices to assure that current requirements are being met. The staff expects to complete its review by May 1996 or the next refueling outage which ever is sooner.

5. Concern: "The NRC relaxed standards and granted license amendments that allowed plants to 'rerack' their rods in ever more tightly packed pools." (Page 50, Column 2)

   Response: The NRC has not relaxed standards in review of rerack of spent fuels.

6. Concern: "In a worst...Northeast's Haddam Neck plant in 1984, a seal failure caused 200,000 gal. to drain in just 20 min. from a water channel next to the fuel pool. If the gate channel and the pool had been open, the pool could have drained, exposing the rods and causing the meltdown." (Page 50, Column 3, Paragraph 1)

   Response: The event did occur. However, the staff's assessment concluded that melting of the fuel would not have occurred even assuming that the spent fuel pool had drained. The staff followed up the event and took generic action which included steps to minimize the potential that the fuel can be exposed as a result of seal failures and improving the reliability of such seals.

7. Concern: "The agency's analysis [in NUREG-1353] for a fuel pool drainage accident assume that at most, one-third of the core is in the pool." (Page 50, Column 3, Paragraph 2)

   Response: The agency analysis, in NUREG-1353, included one-third core of recently transferred fuel, plus the remainder of fuel pool full with spent fuel discharged to the fuel pool during previous refueling outages.

8. Concern: "Petition was outside the scope...ignored my client and denied his petition then validated his concerns after the fact." (Page 54, Column 1, Paragraph 2)

Response: On October 26, 1995, the NRC acknowledged Mr. Galatis' 2.206 petition. The staff informed Mr. Galatis that it found that one of Mr. Galatis' requests which related to denying the license amendment proposed by the licensee for Millstone 1 did not meet the criteria for review under the provisions of 10 CFR 2.206. Other aspects of Mr. Galatis' petition related to enforcement are still under review.

MR. MYERS: It appears that guidelines that are routinely waived should be re-examined and changed, or not waived. Why are there so many waivers provided?

CHAIRMAN JACKSON:

I agree with your concern. There is a need to refine NRC's regulatory framework, as well as a need for the industry to take advantage of the improved tools that are already in place (e.g., program for improving standard technical specifications), and make changes where the framework is outdated, no longer makes sense, or unduly burdensome.

The goal is to maintain safety while improving efficiency in implementation. Once reform has taken place, there should not be the need to issue multiple exemptions from regulations or, for reactor licensees, to exercise enforcement discretion from technical specifications or license conditions.

The staff is examining those regulations for which we have granted multiple exemptions to determine whether we need to change the regulations. Preliminary statistics indicate that approximately 70 percent of the exemptions are associated with six rules (fire protection, containment leakage testing, property insurance, emergency planning, general design criteria, and physical protection). We have amended the regulations pertaining to

containment leakage testing and are examining our regulations in the other mentioned areas to determine whether amendments are needed.

NRC has implemented a technical specifications improvement program that is aimed at eliminating license constraints that do not contribute to safety. Licensee adoption of these improved specifications will reduce regulatory burden on the licensees and reduce the need for waivers from unnecessary technical specifications. In total, licensees for approximately 80 units have converted, or are pursuing conversions, to the new technical specifications.

MR. MYERS: It is alleged that Millstone violated federal guidelines by: moving full cores (since the early 1970s) and ignoring the 250-hour cool-down period. An NRC spokeswoman was quoted as saying the NRC was aware of the full core offloads. Is this proper procedure?

CHAIRMAN JACKSON:

The procedure is not proper. The NRC staff was aware the licensee routinely performed full core offloads to the spent fuel pool. However, the inspection staff was apparently not aware that the licensee's analysis of the spent fuel pool did not support this practice. The NRC staff is currently reviewing the Northeast Utilities's (NU's) past core offloading practices as part of its overall review of a petition submitted pursuant to 10 CFR 2.206 in August 1995.

Prior to the Millstone Unit 1 full-core offloading in November 1995, NU modified the spent fuel pool cooling system and revised its procedures to handle subsequent full-core offloads. On the basis of these design modifications and procedure revisions, NRC approved on November 9, 1995, an amendment to the operating license that permits a full-core offload as a normal refueling practice. A request for a hearing has been filed regarding this license amendment.

MR. MYERS: The article goes on to say that the NRC was aware of these practices for more than ten years, and that Millstone was not the

only plant that violated these safety guidelines. How many years did the NRC knowingly allow these procedures to continue? What plants carried out these refuelings?

CHAIRMAN JACKSON:

The NRC staff was not aware that either Northeast Utilities' (NU, Millstone licensee) or other licensees' refueling practices were not supported by their individual plant's licensing basis for the past 10 years. In fact, the NRC staff first became sensitive to the fact that the Millstone spent fuel pool operation was not fully supported by analysis in an October 1993 Licensee Event Report from NU.

As a result of the concerns raised, NU applied for an amendment to their license which was approved by NRC in November 1995.

When older plants were licensed, the NRC expected full-core offloads to occur only a few times over a plant lifetime or under certain conditions. Newer plants, however, were analyzed and approved for full-core offloads as a normal practice during initial licensing. As a result of issues raised by the Millstone core offloading process, the NRC staff initiated a survey of spent fuel pool practices to determine if these practices were properly supported by the facilities' licensing basis. The survey focuses on the core offload practices and irradiated fuel decay heat management during refueling outages. The survey is due to be completed in mid-April. This survey is part of a review of spent fuel pool storage issues that will aid in determining if any changes are needed in our regulations or regulatory processes.

MR. MYERS: You pointed out that the NRC had "3,000 employees and just four inspectors for every three plants." Were you suggesting that the problem was the result of a shortage of staff?

CHAIRMAN JACKSON:

No, it was not meant to suggest that the problem was the result of a shortage of staff.

MR. MYERS: What can be done to address the revolving door between the NRC and high-paying industry jobs? Does this Commission agree that this can cause problems in maintaining the integrity of the regulatory process?

CHAIRMAN JACKSON:

Congress has enacted post-employment restrictions on a government-wide basis (18 U.S.C. § 207). Congress made a policy decision that former government employees, regardless of rank, are not to be barred from employment with any private sector employer after government service. Instead, statutory limitations have been placed on a former Federal employee's ability to represent private parties back to their former agency. Departing NRC employees are given material on the post-employment restrictions and encouraged to seek advice from our Office of the General Counsel. After leaving government service, former NRC employees frequently consult with our Office of the General Counsel on post-employment issues. Any changes to the law, which would restrict post-employment opportunities, should be made on a government-wide basis rather than focused on a single agency, such as the NRC.

The NRC does not believe that the activities of its former employees denigrate the integrity of the regulatory process. Those NRC employees who accept employment with the nuclear industry bring to their new employers an understanding of regulatory requirements and a commitment to public health and safety that should further the national interest by enhancing the safety culture of the private sector. We would note that virtually all former NRC employees who have accepted employment with the nuclear industry are embarked on long-term private sector careers and do not return to government employment.

MR. MYERS: Perhaps more significant than the individual allegations was the description of an industry where, as pointed out by a study by Northeast Utilities, "38% of employees do not trust their management enough to willingly raise concerns because of a 'shoot the messenger' mentality." The NRC has announced yet another whistleblower study. This is not a new issue, but it is a critical, potentially dangerous problem. What improvements can we make this year to address this very troubling problem?

CHAIRMAN JACKSON:

The NRC has an active program for following up on allegations. The information that industry employees provide to supplement NRC oversight function is important to our defense-in-depth approach to nuclear safety. NRC values greatly the contributions of so-called "whistleblowers," and has so stated on a number of occasions, including in "Reassessment of the NRC program for Protection of Allegers Against Retaliation," (NUREG-1499). The reassessment resulted in 47 recommendations for improving the NRC's allegation process.

Currently, the NRC has completed staff action on 24 of the 47 recommendations. Another 5 recommendations have been implemented through interim guidance. On March 14, 1996, the staff forwarded to the Commission for approval a final policy statement, "Freedom of Employees in the Nuclear Industry to Raise Safety and Compliance Concerns Without Fear of Retaliation." This policy statement informs the industry of the Commission's expectations for creating and maintaining an environment in which industry employees can raise safety and compliance concerns without fear of retaliation. Upon Commission approval, the staff will have implemented another 5 recommendations.

We plan to take an integrated look at the problems of selected whistleblowers at Millstone Station. NRC has assigned a senior manager to oversee a group of staff to study the 10-year history of the licensee's handling of employee concerns and of the NRC's handling of allegations related to licensed activities at Millstone station. Studies of selected cases are in progress to identify root causes, common patterns between cases, and lessons learned from

the experiences of whistleblowers at Millstone station that caused them to lose confidence in both the licensee and the NRC. These lessons will be used to determine what further improvement can be made in our process.

MR. MYERS: Another troubling issue is the claim that NRC officials knew what was going on, but were not aware that the actions represented violations of guidelines. What is being done to ensure that NRC officials are performing their jobs effectively? Is periodic testing required for inspectors?

CHAIRMAN JACKSON:

Both the NRC and the licensees need to increase their attention to ensuring that plant practices fully conform to NRC regulations. Increased clarity and consistency in all of NRC's actions and requirements will improve the situation and will contribute to improved communications with the public, for example, emphasis upon plants converting to Improved Standard Technical Specifications, revised procedures related to granting of enforcement discretion and review of exemptions from NRC requirements have been undertaken.

With respect to the Final Safety Analysis Reports and spent fuel pools specifically, which was the focus of the article, a number of activities are underway. They include a complete review of spent fuel pool design, operating and licensing bases at each reactor site -- this is across the country -- revisions to inspection guidance to increase inspection of licensees' implementation of their Final Safety Analysis Reports and recommendations to improve the quality and timeliness of regulatory response when discrepancies are found between the Final Safety Analysis Report and its implementation, not just for spent fuel pools.

The NRC inspection team at Millstone Units 1,2, and 3, and Haddam Neck, has been directed to address potential weaknesses in NRC inspection oversight at these sites related to the licensees' handling of degraded and nonconforming conditions and conformance with NRC requirements. The results of these

inspections may identify additional concerns with NRC's inspection program guidance.

In addition to these specific activities, the staff is performing a broad-based review which integrates and provides recommendations addressing both the licensing and inspection aspects of the reactor regulation program. Information obtained through various Millstone inspections and review efforts will be used as input to this program.

In other activities, I have directed the staff to undertake:

- improved NRC oversight of facility changes pursuant to 10 CFR 50.59 which allows changes made without prior NRC approval,

- use of risk insights or risk-informed performance-based regulation which allows NRC to focus on the most safety significant aspects of reactor operations, and

- integrated assessment of nuclear facilities from inspections and other activities in order to identify problem plants such as Millstone early.

For initial qualification, NRC inspectors are required to meet specific standards including on the job training, formal training courses including simulator training, and certification by regional management. Periodic refresher training, including formal and reactor simulator training, are required for each inspector. The staff is also developing guidance for training of newly assigned resident inspectors to ensure they become familiar with the specific plant operating experience, history and design basis.

I have also asked the IG to provide an integrated assessment and the management implications of his findings which are to be used in conjunction with NRC staff assessments as the basis for any changes NRC needs to make.

MR. MYERS: The article portrays a cozy relationship between NRC inspectors and industry, including consultations described as "quiet

coaching" and an incident where the IG found a draft of an NRC inspection report that had been e-mailed from NRC to Northeast Utilities. Has the NRC investigated these allegations? If the allegations were true, what penalties could be levied? Is this an area of concern for the NRC?

CHAIRMAN JACKSON:

Regarding the issue of "coziness" and "quiet coaching" between the staff and licensee, many of our people out in the field are often in situations where there are few of them at sites with many licensee employees. The types of guidance and regulatory process changes that I have outlined are critical in helping all of our people to do their jobs while avoiding being drawn inadvertently and inappropriately into either coaching licensees or giving the appearance of telling them how to manage their facilities.

The ultimate responsibility for operational safety rests with those who operate nuclear facilities. NRC must provide vigilant, clear and fair oversight.

We believe that the purported draft inspection report that was electronically mailed to the licensee was actually a final report that had been electronically mailed in advance of the signed copy.

It is a long standing policy that agency employees not provide copies of draft inspection reports to licensees.

MR. MYERS: When did this senior engineer first approach the NRC? In light of the substantial problems that have come to light, is it a concern that it took years for the NRC to place Millstone on its "Watch List"?

CHAIRMAN:

The senior engineer formally approached the NRC in April 1994 with a concern expressed to our Region I field office in King of Prussia, PA.

I do have questions regarding our regulatory oversight of the Millstone facilities. I have tasked the staff to perform a lessons-learned study based on the events at Millstone. I intend to ensure that areas for improvement in our inspection and oversight process as well as our senior management process for identifying "Watch List" plants are carefully examined.

DECONTAMINATION STANDARDS

MR. MYERS: It has come to our attention that the EPA and NRC both are working on standards for decontamination. There may or may not be a legitimate reason or statutory mandate for each agency's involvement; we are concerned here with the cost of these activities and whether they are being conducted in the most cost-effective manner with the least amount of overlap and duplication. We are also concerned with the high cost of cleanup of DOE facilities, for which these standards are desperately needed so that DOE is not forced to clean everything up to a "Garden of Eden" level. What is your reaction to this concern?

CHAIRMAN JACKSON:

NRC and EPA have been actively cooperating in the development of the cleanup standards since 1993. EPA agreed in 1992 that it would not apply its cleanup standards to NRC and Agreement State licensed facilities if EPA found that NRC's requirements provided sufficient protection of the public and environment.

NRC initiated its rulemaking to develop the radiological criteria due to continued delay in establishing generally applicable environmental standards in the 1970s and 1980s. The Commission determined that development of the criteria deserved a high priority to provide confidence that facilities were adequately remediated prior to release and to provide certainty to licensees about the costs associated with decommissioning.

The agencies have been cooperating in the development of the regulations and the supporting technical basis through frequent interactions at the staff

level, the Interagency Committee on Cleanup Standards, and, more recently, through the Interagency Steering Committee on Radiation Standards (ISCORS).

The draft standards of both agencies are substantially similar and both allow for restricted release of contaminated sites.

MR. MYERS: Please describe your activities to develop standards governing residual radioactivity for cleanup of surface and volumetric-contaminated materials. How have you coordinated your efforts in this area with related activities at EPA? Exactly what staff time and support have you provided to the Interagency Steering Committee on Radiation Standards (ISCORS)?

CHAIRMAN JACKSON:

NRC proposed its radiological criteria for decommissioning rule (10 CFR 20) in August 1994. Since then we have been reviewing public comments on the rulemaking, conducting additional assessments of the costs and benefits of the rule, coordinating the regulations with EPA, and developing technical guidance that would be required to implement the rule.

NRC and EPA have been actively cooperating in the development of the cleanup standards since 1993. EPA agreed in 1992 that it would not apply its cleanup standards to NRC and Agreement State licensed facilities if EPA found that NRC's requirements provided sufficient protection of the public and environment.

The agencies have been cooperating in the development of the regulations and the supporting technical basis through frequent interactions at the staff level, the Interagency Committee on Cleanup Standards, and, more recently, through the Interagency Steering Committee on Radiation Standards (ISCORS).

The interactions have occurred on a continuing basis at the staff level with periodic discussions at the senior management level since 1993.

Despite the extensive cooperation between NRC and EPA, several issues remain to be resolved, however, between the agencies. These include: (1) the need for a separate groundwater protection limit which EPA desires, (2) alternative standards when compliance with an establish dose limit is not feasible, and (3) implementing requirements for the dose standards, including provisions for allowing restricted release of facilities after cleanup.

NRC has provided approximately 1 FTE in staff time support to ISCORS since establishment of the Committee in March 1995. Most of this effort would have been spent anyway in resolving the same issues through bilateral discussions between the agencies on radiation protection matters. NRC and EPA co-chair ISCORS. Responsibility for coordinating the meetings, preparing meeting summaries, and distributing information to all of the involved Federal agencies is shared between NRC and EPA.

USER FEES

MR. MYERS: NRC's Budget Execution Report - August /September 1995 shows that NRC had 352 licensee accounts that were over 365 days past due. What are the different types of licensees representing the overdue payments and why are there so many accounts that have not been paid by the licensees? What is NRC doing to collect these amounts in order to reduce the amount of appropriations the Congress needs to make to NRC to carry out its activities? Is a portion of the fees paid by licensees used to offset revenue not received from those licensees who are delinquent?

CHAIRMAN JACKSON:

The NRC collected approximately $509 million in fees from licensees in FY 1995. The 352 delinquent debts over one year old at the end of FY 1995 amounted to $1.9 million, or less than one-half of one percent of the fees collected. Through the first five months of FY 1996, this delinquent debt has been reduced approximately 25 percent. This delinquent debt is mostly from annual fees charged to small nuclear materials licensees such as gauge users,

doctors, hospitals, radiographers, and well loggers. Approximately one-half of the debt was incurred by individuals no longer licensed by NRC.

The NRC has recently adopted a formal debt collection strategy which incorporates the actions that NRC utilizes to collect debts. This strategy is intended to facilitate debt collection by providing a systematic, uniform method for debt collection. This strategy includes the NRC issuing an initial request for payment and at 30-day intervals second and final requests for payment. If the debtor is a current NRC licensee, an order is issued to suspend the license after the final demand for payment. Once all internal NRC administrative procedures have been exhausted, the NRC refers the debt to Treasury for collection. The cross-servicing agreement the NRC has with the Department of the Treasury, Debt Management Services, makes a variety of debt collection techniques and tools available to NRC. These include letters, phone calls, collection agency referral, tax refund offset, administrative offset, credit bureau reporting and referral to the Department of Justice.

The NRC license fee collections are based on the budget authority appropriated to the NRC. Thus, NRC's delinquent debt does not affect the amount to be collected. Additionally, the NRC does not use a portion of the fees paid by licensees to offset revenue not received from licensees who are delinquent.

NUCLEAR PLANT SECURITY

MR. MYERS: Has the NRC accomplished efficiencies in nuclear power plant security? What measures have been taken to reduce costs while not compromising security?

CHAIRMAN JACKSON:

Yes, we have accomplished a number of actions that increase efficiencies in nuclear power plant security while at the same time reduce costs. None of the actions have compromised security. Examples include the following.

On April 4, 1995, the NRC published a final rule that eliminated the requirement for quarterly submittal of safeguards event logs.

On September 9, 1995, the NRC issued a final rule eliminating extra controls on access from vital areas into reactor containment during outages.

On October 10, 1995, the NRC issued a generic letter that clarified procedures used by licensees to process security plan changes that do not reduce plan effectiveness.

On February 13, 1996, the NRC issued a generic letter that identified areas where licensees could obtain regulatory relief within the context of existing regulations. The staff is also developing a proposed rule that would provide further relief with respect to an internal threat.

The NRC is about to publish a proposed rule change that would reduce the regulatory and cost burdens for fitness-for-duty programs.

MR. PORTER: In December 1995, NRC stated to Sen. Herb Kohl and Rep. Mark Neumann of Wisconsin that it would do an "enhanced" evaluation of the security practices at Zion in its upcoming SALP (Systematic Assessment of Licensee Performance) review. Was this "enhanced assessment" performed? What were the findings?

CHAIRMAN JACKSON:

Yes, an enhanced inspection was concluded on November 22, 1995. Overall, the inspectors found the Zion security program satisfactory. This information was considered in the most recent SALP review.

The inspectors concluded that the licensee's controls for personnel, package, and vehicle access to the protected area were effective. Physical performance tests confirmed proper operation of the access control explosives and metal detectors, the x-ray machines, and the perimeter alarm and closed circuit television systems. In addition, the NRC confirmed that the vehicle barrier system installed at Zion is adequate to protect the spent fuel pool in the fuel handling building from a large explosive device.

The inspectors identified two violations. One involved the licensee's procedure for responding to certain security threat scenarios proposed by our inspectors in table-top drills. In response to our identification of this issue, the licensee implemented immediate compensatory action. The other violation involved two examples of improper assignment of personnel to certain posts. Corrective action included remedial training and counseling by senior management on the need for strict adherence to procedures.

MR. PORTER: The February 1996 SALP rating at Zion for this area of plant performance was "2," or "good/average." Does NRC consider it "good" or is it considered "average" practice to allow unmarked, unchecked vehicles to drive onto reactor sites, and park within 25 yards of the containment of spent fuel pool buildings?

CHAIRMAN JACKSON:

At Zion, 25 yards is a safe standoff distance for the spent fuel building. In addition, the vehicle control measures at Zion provide protection for equipment needed to safely shut down the reactor. Therefore, the NRC has concluded that the plant's security program is satisfactory.

The NRC requires licensees to provide vehicle control measures, including barriers, to protect against use of a land vehicle as a means of transportation to gain unauthorized proximity to vital areas. The vehicle control measures must also protect against a large vehicle bomb. For many reinforced concrete buildings, 25 yards is a sufficient standoff distance to protect vital safety equipment within the buildings. The area required to be protected by vehicle control measures is typically a small portion of the reactor site. NRC has no requirements for vehicle control outside of the area required to be protected.

MR. PORTER: Yes or no, in view of the Oklahoma City and the World Trade bombings, does NRC find it acceptable for unmarked, unchecked

vehicles, such as the van driven into these two reactor sites, to be permitted to enter a reactor's secure area, and drive and park within 25 yards of: a.) the reactor containment buildings; b.) the spent fuel building; or c.) the on-site, back-up diesel generators?

CHAIRMAN JACKSON:

Yes, it is acceptable for an uncontrolled vehicle to reach the location reached by the van. The van did not enter the site's secure area. Twenty-five yards can be an adequate standoff distance, depending on the construction characteristics of the building. The standoff distances and barrier systems at Zion are sufficient to protect equipment necessary to safely shut down the reactor and to protect the spent fuel building.

MR. PORTER: If NRC does not find this acceptable, how is it that present NRC standards result in finding this activity "good" in SALP ratings? Please indicate what NRC regulations currently in effect do anything to prevent this type of activity from occurring?

CHAIRMAN JACKSON:

The design of the barriers and standoff distances at Zion are acceptable.

MR. PORTER: Specifically and with detail, what does NRC calculate the damage in each of these facilities to be in the event of a vehicle bombing using a vehicle of the size of the WTMJ van? For a car? For a larger vehicle?

CHAIRMAN JACKSON:

The staff evaluated Zion for a postulated bomb larger than the WTMJ van bomb, with the current barrier systems and standoff distances, and concluded that sufficient safety equipment would remain operable to safely shut down the reactor and protect the spent fuel. No damage calculations to other parts of the facility were performed.

MR. PORTER: How does NRC justify its confidence in damage estimates, and its own regulations, when explosives experts and nuclear engineers interviewed on tape predict greater damage to these facilities?

CHAIRMAN JACKSON:

The NRC used the expertise of the U.S. Army Corps of Engineers in the development of the vehicle bomb rule and in the evaluation of damage estimates for a range of bomb sizes. The NRC was not provided with or informed of the credentials of the explosives expert and nuclear engineer, interviewed on tape, who apparently have made statements on blast effects on reinforced concrete structures.

MR. PORTER: Are there speed bumps and vehicle barriers in place at Zion? If not, why? If so, why did they not prevent the WTMJ van from getting to within 25 yards of the above-mentioned buildings?

CHAIRMAN JACKSON:

A vehicle barrier system is in place at Zion. (Speed bumps are not mandatory.) As discussed previously, Zion's barrier system provides adequate standoff distances to protect sufficient safety equipment to safely shut down the reactor and protect the spent fuel. The vehicle barrier performed as designed.

MR. PORTER: To date, what level of testing or modeling has been done for reactor containment buildings to determine their ability to withstand the amount of explosives estimated to have been used at the World Trade Center and Oklahoma City bombings? For the spent-fuel pool building? For the auxiliary generators? For spent-fuel "dry casks"?

CHAIRMAN JACKSON:

For reinforced concrete buildings such as the spent-fuel pool building and auxiliary generators, the methodology used by the U.S. Army Corps of Engineers

for close-in charges is based on empirical data obtained from tests involving heavy reinforced concrete construction. For greater distances, the methodology has been validated against, and modified on, empirical data obtained in tests involving both light and heavy reinforced concrete construction. Reactor containment has thicker and more highly reinforced concrete walls than these buildings, and would withstand explosives such as those estimated to have been used at the World Trade Center and Oklahoma City at standoff distances shorter than the minimum distance allowed by NRC regulations and implementing guidance.

Extensive modeling was done to determine the effects on spent-fuel dry storage casks of explosive yields that encompass the yields estimated to have been used at the World Trade Center and the Oklahoma City bombings. The modeling assumed no physical protection interference with the sabotage and showed that radiological effects, even with conservative assumptions, would be well below the design basis accident guidelines in the NRC's regulations.

MR. PORTER: Have any real-life tests (not computer or engineering simulations) been conducted to determine the ability of these buildings to withstand such blasts?

CHAIRMAN JACKSON:

Yes. The methodology used by the U.S. Army Corps of Engineers for close-in charges is based on empirical data obtained from tests. Therefore, a high degree of confidence in the analyses exists.

MR. PORTER: Could not such real-life tests be conducted on reactor buildings slated for decommissioning to determine real-life effects, and help design real-life solutions?

CHAIRMAN JACKSON:

As previously stated, the NRC does not believe further testing is needed. NRC regulations for decommissioning facilities would not permit conducting "real-life" tests until all decommissioning activities are completed, including

licensee and NRC surveys for any residual radioactive material, and the facility is released for unrestricted use.

MR. PORTER: During the Gulf War, America witnessed the ability of so-called "smart ordinance" to penetrate reinforced bunkers and structures of equal or greater integrity than that of reactor buildings. Additionally, Iraqi main battle tanks with special armor were easily destroyed by anti-tank and shoulder-held missiles and projectiles.

What does NRC estimate would happen if such ordinance were on: a) reactor buildings (reinforced); b) spent-fuel pool buildings (less reinforced); c) auxiliary generator buildings; d) non-reinforced dry casks for storage of spent reactor fuel, currently in use at two reactors on the shores of Lake Michigan, the Palisades reactor in Michigan, and at Point Beach in Wisconsin?

CHAIRMAN JACKSON:

"Smart Ordinance" launched from military aircraft and naval ships during the Gulf War is a Department of Defense activity and not a capability normally attributed to terrorists or one that licensees are required to defend against. Such defense, if required, would be the responsibility of the U.S. Government (DOD). The use of shoulder launched missiles with a shaped charge warhead, however, has been examined by the NRC and the DOE. Such devices cause damage through formation of a high pressure particulate jet which may be a fraction of an inch in diameter and has the capability to penetrate two or more feet of metal, eroding everything in its path. To be conservative, rather than using the smaller shaped charge found in the warhead of shoulder launched missiles, the experiments were performed using the U.S. Army M3A1, one of the largest man-placed shaped charges readily available. Results indicated that the M3A1, depending on material type, density, thickness, etc. of the target, could create a small exit hole a few millimeters in diameter. The effects of the plasma jet from the shaped charge are largely anti-personnel in nature and are meant to kill the people inside a tank. Effectiveness of such devices is further limited by the low likelihood of hitting specific vital components.

Because of redundancy in design and separation requirements for safety equipment, sufficient safety equipment would remain to safely shut down the reactor. With respect to spent fuel storage casks, experimental studies undertaken in the 1980's used the M3A1 shaped charge against a spent fuel cask, assumed a high population density of 200,000 persons per square mile, and calculated the radiological consequences to be no early fatalities and less than one (0.4) latent cancer fatality. These conservative assumptions and test results using M3A1 bound the radiological consequences of the use of such devices on dry casks in the United States.

MR. PORTER: A recent ad by CMS, a weapons manufacturer, states, "By increasing velocity, range, and accuracy, CMS has transformed the Dragon weapon system into SUPERDRAGON. Now, it can reach a target 1500 meters away with an 8.6 second time-of-flight...and a one-man crew can defeat modern day battle tanks equipped with reactive armor...SUPERDRAGON is the economical way to make the individual soldier a match for any armored vehicle.

Modern main battle tanks have frontal armor 10"-14" thick, and of a special metal alloy and composite composition. This missile apparently can overcome this armor system, which does not exist at nuclear power facilities.

Please state the effects of a direct hit by a SUPERDRAGON shoulder-held missile on each of the four above-mentioned facilities. What would the effects be if the missiles were first brought on site in unmarked, unchecked vans?

CHAIRMAN JACKSON:

Super Dragon (Dragon III), although improved from versions I and II, in weight, range and by addition of a liner, is, nonetheless, still a shaped charge which does its damage via the war head's high pressure, high temperature, plasma being released into a small, confined space, e.g., the interior of a tank. The effects are not anticipated to be different from the

results of the previously conducted examination noted in your previous question.

MR. PORTER: NRC and the utilities point to the installation of speed bumps and traffic dividers as a means of protecting reactors from truck/van bombings. How high would these bumps have to be to halt a SUPERDRAGON brought on site by an unmarked, unchecked van?

CHAIRMAN JACKSON:

Speed bumps are not intended to be, or accepted as a method to halt a vehicle. Speed bumps are a supplemental option that can be used to slow a vehicle, allowing use of less substantial barriers to stop the vehicle than the barriers that would be needed for a vehicle traveling at high speeds.

MR. PORTER: While pointing to the installation of speed bumps, traffic dividers, and other devices as evidence that the reactor sites are safe, NRC has a demonstrated record of granting license variances and waivers of its recently written "truck-bomb" rules. What is the basis for granting such license variances? How does this granting of variances serve to protect the public? Please provide Congress with a copy of the written objective and consistent rules/guidelines/decision trees for granting such variances to licensees.

CHAIRMAN JACKSON:

No license variances or waivers of the "truck-bomb" rule have been granted to date.

A "Schedular Exemption" was granted to Watts Bar Unit 1 to not implement the land vehicle bomb control program until February 17, 1996, the date that had been established for operating plants.

On February 15, 1996, a special inspection verified that the Watts Bar licensee had completed implementation of land vehicle control measures that

were consistent with NUREG/CR-6190, "Protection Against Malevolent Use of Nuclear Power Plants." Power ascension for initial startup above 50% power has not yet occurred.

MR. PORTER: The security guards at the Zion plant stated that, as a result of "downsizing" staff levels and reducing the numbers of armed personnel, they felt they no longer have the ability to resist a "determined intruder" at the nuclear plant. What hard evidence does NRC possess to refute this claim by the people charged with this task?

CHAIRMAN JACKSON:

The NRC conducted a special security inspection at the Zion nuclear plant that concluded on November 22, 1995. Overall, the inspectors found the zion security program satisfactory.

With respect to the security forces' ability to resist a "determined intruder," table-top, time line drills were conducted using NRC designated threats. During these drills, it was determined that Zion's procedures to respond to certain security threat scenarios did not meet regulatory requirements. The problem was not with the number of available responders, but with the strategy for positioning and deploying them. In response to this finding, the licensee implemented immediate compensatory action. An independent consultant's recommendations for permanent changes are currently under review by station management. Full implementation is scheduled by August 5, 1996. NRC has scheduled an onsite examination and validation beginning August 5, 1996.

YUCCA MOUNTAIN

MR. BEVILL: In testimony and other statements from the Department of Energy, they say that by 1998 DOE will be ready to issue a "viability assessment" for siting the high-level nuclear waste repository at Yucca Mountain. Please discuss your analysis of this term,

especially in relation to the Secretary of Energy's statutory responsibility to certify "site suitability."

CHAIRMAN JACKSON:

DOE has informed us that the viability assessment is a DOE decision making process, a DOE statement to clarify the most uncertain aspects of geologic disposal at Yucca Mountain and give sufficient financial and technical data to allow the Congress to decide whether to continue the program to repository licensing and construction.

The viability assessment will only include four elements:

- Reference repository and waste package design
- Total System Performance Assessment
- Cost for preparing a license application
- Cost and schedule for repository construction and operation

The site suitability determination by the Secretary of Energy is provided for in the DOE Siting Guidelines in 10 CFR Part 960 developed by DOE for use by the Secretary in evaluating the suitability of sites for the development of a repository. Under 10 CFR Part 960, the site suitability evaluation would be carried out in connection with any recommendation by the Secretary of Energy for the Yucca Mountain site for development of a repository. Further, it would be based on making a sequence of high-level findings for the qualifying and disqualifying conditions of the Siting Guidelines.

MR. BEVILL: In the opinion of the Commission, when do you expect DOE will be able to submit a license application to operate Yucca Mountain?

CHAIRMAN JACKSON:

From discussions with DOE management it is NRC's understanding that a license application could be prepared by 2002. We believe it is possible for DOE to develop a license application by this date if adequate funding is provided, reasonable and implementable high-level waste standards are developed by EPA

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considering National Academy of Sciences recommendations, and sufficient interactions occur between DOE and NRC prior to that date to address key technical issues regarding the conceptual design of the repository and its expected performance in the geologic setting.

NRC RESOURCES

MR. KNOLLENBERG: Last year before this subcommittee, Commissioner Kenneth C. Rogers stated that the NRC's primary responsibility is the "safety" of the operating nuclear reactors. And I salute the NRC's efforts in continuing to safely oversee our nation's nuclear power reactors. However, I also believe that misplaced resources, including oversized staffing levels, will not nurture a policy of safety nor reap good fiscal policy.

Last year Commissioner Rogers also stated that the NRC was operating with 3,377 people and that "as of the 1996 budget" the NRC had 3,185. He then stated that by the end of FY 1996, the NRC would scale back an additional 192 people. What are the current staff levels? Do you expect to meet the FY 1996 goal? What are the goals for further streamlining in FY 1997?

CHAIRMAN JACKSON:

The NRC's FY 1993 baseline staffing level was 3,377 full-time equivalent staff (FTEs). Under the Federal Workforce Restructuring Act (FWRA) guidance, the planned NRC staffing levels for FY 1996 and FY 1997 were 3,185 FTE and 3,144 FTE, respectively. The reduction between the FY 1993 baseline and the FY 1996 target was 192 FTEs.

Consistent with guidance from this subcommittee, the NRC has accelerated its planned staff reductions for FY 1996 and FY 1997. As shown in our recent FY 1997 budget submission, our planned FY 1996 staffing level is 3,160 FTEs and the planned FY 1997 staffing level is 3,120 FTEs. This results in a total

reduction of 257 FTEs from the FY 1993 baseline by FY 1997. We expect to achieve both our FY 1996 and FY 1997 planned FTE reductions.

MR. KNOLLENBERG: Commissioner Rogers also stated that the supervisor ratio was once 4 to 1. That last year the NRC had reached a 5 to 1 ratio. And that a reorganization plan was "in the works" to implement an 8 to 1 supervisor ratio by the end of 1999.

Have the reorganization plans been implemented and will the NRC reach the 8 to 1 ratio by your 1999 target?

CHAIRMAN JACKSON:

NRC established a goal of reaching an 8 to 1 employee to supervisor ratio by the end of FY 1999. Reorganizations have occurred which support our efforts to achieve this goal. At present, we have achieved a change from approximately 4 employees to 1 supervisor, to approximately 6 employees to 1 supervisor. Additional reorganization plans will further support our efforts to achieve a goal of 8 employees to 1 supervisor so long as this can be accomplished without an impact in carrying out our safety mission. The Strategic Assessment and Rebaselining initiative which is currently underway, may identify opportunities for further progress.

MR. KNOLLENBERG: What portion of the NRC budget, if any, goes towards outside contracts and contractors?

If there are outside contracts, what are the employee levels of the contractors and sub-contractors?

CHAIRMAN JACKSON:

The NRC's FY 1997 budget includes $195 million for contract support. This is approximately 42 percent of the agency's budget. These contract support funds are used for a variety of requirements such as rent, utilities, supplies, materials, training, technical and office equipment, nuclear safety research,

and technical assistance required to support NRC's reactor regulation and nuclear materials activities.

The NRC does not maintain records on contractor or subcontractor employee levels. However, the staff estimates that the agency's FY 1997 contract support pays for the services of approximately 650 full-time equivalent contractor employees.

MR. KNOLLENBERG: Other than reductions in staffing levels, what other opportunities for streamlining the NRC are available during FY 1997 and beyond?

CHAIRMAN JACKSON:

As you know, one of my first actions as Chairman of the NRC was to initiate a strategic assessment and rebaselining of the agency. This is necessary to position the NRC to better meet the challenges we face, to guide our activities and decision-making in the future, and to systematically incorporate ongoing streamlining and efficiency initiatives.

The first phase of the initiative, the "strategic assessment," involves a review and categorization of each agency activity to see if and how it ties into our statutory mission, Presidential Directives, or Commission policy, or if it has some other rationale for its existence. It is also designed to identify key strategic issues, questions and decision-making points to be addressed by the Commission. This phase is essentially complete.

In the subsequent phases, decisions by the Commission on the key strategic issues will form the basis of a new NRC strategic plan. This plan will be responsive to Administration and Congressional objectives to improve efficiency by reducing unnecessary regulatory burden and by improving NRC internal processes. It is intended to bring a comprehensive, agency-wide perspective to our decision-making.

We expect the preliminary results of strategic assessment and rebaselining to be available in early summer, allowing stakeholders to provide input into the decision making process. The final results will form the basis for the FY 1999 budget request. In addition, as results become available, we plan to use them to influence the scope and direction of the FY 1998 budget submission to the greatest extent possible.

STATEMENT SUBMITTED BY

UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

UNITED STATES HOUSE OF REPRESENTATIVES

CONCERNING

THE FISCAL YEAR 1997 BUDGET FOR THE

NUCLEAR REGULATORY COMMISSION

PRESENTED BY

DR. SHIRLEY ANN JACKSON

CHAIRMAN

SUBMITTED: MARCH 27, 1996

U.S. NUCLEAR REGULATORY COMMISSION
FY 1997 BUDGET TESTIMONY

Mr. Chairman and members of the Committee, we are pleased to appear before you to discuss the Nuclear Regulatory Commission's (NRC) budget request for fiscal year 1997. Accompanying Commissioner Rogers, Commissioner Dicus, and myself are the NRC Executive Director for Operations and Chief Financial Officer, the General Counsel, and the Inspector General.

Before proceeding with my prepared statement, I want to express the agency's appreciation to Chairman Myers and Congressman Bevill for three decades of distinguished service in the U.S. House of Representatives. Over the years, the NRC has had the benefit of your critical, but fair, review of our programs and operations, and we would like to extend our best wishes to you in your future endeavors.

Today we will first highlight the NRC vision for the future and our approach to accomplishing that vision; secondly we will discuss the NRC's major programs; and then we will address the specifics of the NRC's FY 1997 budget.

VISION FOR NRC

The environment within which NRC operates is changing on many levels. The NRC, as is the case for all government agencies, is facing increasing budget constraints as the federal government grapples with the deficit. Likewise, those we license and regulate to ensure the safe use of nuclear materials are facing economic constraints of their own, through deregulation for reactor licensees and cost reduction initiatives undertaken at the state and federal levels, as well as through market-based forces. At the same time the NRC is being asked to take on new responsibilities relative to its mission.

In light of this changing environment the Commission is articulating a new vision which will undergird all that we do while tying together new and ongoing initiatives to improve our regulatory processes. It will incorporate three principles which have guided a number of our recent initiatives: 1) affirming our fundamental health and safety mission, including its national defense and security elements, 2) ensuring regulatory effectiveness, and 3) positioning the NRC for change.

Affirming NRC's Health and Safety Mission

The health and safety mission of the NRC encompasses more than reactors, and goes beyond initial licensing. Licensing of nuclear facilities and activities is one critical part of what

the NRC does. Licensing builds safety into a nuclear operation -- in the design, construction, and initial operation of a new nuclear facility or nuclear activity.

An equally critical part of our mission is the regulatory oversight of operational safety which focuses on conservatism in operations, and the assurance that equipment, especially the most safety significant equipment, is appropriately monitored and maintained during a time of economic challenge and restructuring for the nuclear power industry.

Ensuring Regulatory Effectiveness

Ensuring regulatory effectiveness has many facets. It means keeping a primary focus on adequate protection of public health and safety and minimizing risk at reasonable cost as a basis for any new regulation or change to an existing one. It also means considering ease of implementation, consistency with other applicable statutes and regulations and internal guidelines, fairness, and the fit of the regulation into the entire regulatory program. An important element of regulatory effectiveness is the use of risk analysis insights. The movement to risk-informed, performance-based regulation, allows both the NRC and nuclear licensees to focus their resources on the most safety significant aspects of nuclear operations, while maintaining safety defense-in-depth.

Positioning the NRC for Change

The NRC must position itself to respond to a changing environment, and must understand its effect on the scope and focus of major NRC programmatic activities, including possible new areas of NRC regulatory responsibility. In the United States, change in the nuclear industry is being driven by market forces and competitive pressures to which individual licensees are responding. The NRC in its role as independent safety regulator must also respond to the changes in the nuclear power and nuclear materials industries. Similar changes are occurring and are affecting the international nuclear community. Other issues specifically impacting nuclear power industry activities worldwide, including those in the U.S., are aging of nuclear power plants, and waste storage and disposal.

Since NRC's primary focus must remain on the safety of U.S. nuclear industries, including nuclear power licensees, we must keep abreast of how rate deregulation, competition, and economic constraints affect reactor licensees. We believe, as regulators, that nuclear generators of electricity faced with a competitive market must provide sufficient resources devoted to nuclear operations to continue to maintain high safety standards, and that decommissioning funding assurance must be maintained. Because of our concerns in this area, we have asked the NRC staff to perform a comprehensive review of existing NRC regulations to

determine what changes may be needed to respond to the ongoing restructuring.

Another potential change to NRC's activities relates to the Department of Energy's (DOE) intention to develop a High-Level Radioactive Waste Solidification System at Hanford, Washington. DOE has requested NRC involvement in its pilot project to help facilitate the eventual NRC licensing of DOE contractors' facilities in the early 2000's. During FY 1997, NRC will begin development of an overall review strategy to be made available as guidance for DOE's contractors.

In FY 1997, the NRC will also begin working, through a memorandum of understanding, with the Department of Energy (DOE) on determining the primary and backup approach to tritium production. One alternative designated by DOE for evaluation is the production of tritium in commercial light-water reactors. The NRC will assist DOE in assessing and resolving technical and licensing issues to support a DOE decision on the primary and backup tritium production approach. The production of tritium under an existing commercial license would require DOE and NRC to develop mechanisms to assure that national defense production requirements will not conflict with regulation of the facilities, including plant shutdown for safety reasons. This would likely involve the use of multiple reactors for tritium production. The NRC will evaluate the necessary licensing requirements to implement a DOE option of producing tritium in commercial reactors.

Consistent with the recommendations of the Advisory Committee on External Regulation of Department of Energy Nuclear Safety, DOE is considering an NRC role in the oversight of DOE's nuclear safety activities. While the NRC does not take a position regarding the desirability of external regulation of DOE nuclear safety activities, we have expressed the view that NRC would be the appropriate agency to perform this role. Such an increase in our regulatory responsibilities to encompass DOE facilities would require adequate resources and sufficient time to develop a sound regulatory program.

Another facet of our changing environment is the effort across the government to reduce the size of government through streamlining and increased efficiency. The NRC has, since 1993, been on a trend of decreasing staff size consistent with the Federal Workforce Restructuring Act. We have, through significant efforts on the part of NRC management, in fact accelerated the planned staff reductions beyond the goals established by that Act. I will be addressing the specifics of our efforts to develop responsible staff and funding levels in more detail shortly.

STRATEGIC ASSESSMENT AND REBASELINING

The NRC has, for a number of years, engaged in long range planning for utilization of agency resources. However, against the backdrop of change in our regulatory and fiscal environment, and consistent with the three governing principles outlined earlier, one of my first actions as Chairman of the NRC was to initiate a strategic assessment and rebaselining of the agency. This is necessary to position the NRC to better meet the challenges we face, to guide our activities and decision-making in the future, and to systematically incorporate ongoing streamlining and efficiency initiatives.

The first phase of the initiative, the "strategic assessment," involves a review and categorization of each agency activity to see if and how it ties into our statutory mission, Presidential Directives, or Commission policy, or if it has some other rationale for its existence. It is also designed to identify key strategic issues, questions and decision-making points to be addressed by the Commission. This phase is essentially complete.

In the subsequent phases, decisions by the Commission on the key strategic issues will form the basis of a new NRC strategic plan, responsive to the Government Performance and Results Act of 1993 (GPRA), which is targeted to being in place by the end of calendar year 1996. This plan, and the activity assessments and Commission decisions which undergird it, will drive any rebaselining of the agency and will be responsive to Administration and Congressional objectives to improve efficiency by reducing unnecessary regulatory burden and by improving NRC internal processes. But, it is intended to go well beyond that.

This strategic assessment and rebaselining is bringing a comprehensive, agency-wide perspective to our decision-making process and builds on NRC's efforts in recent years to improve our regulatory programs. The NRC has conducted self-assessments as well as encouraged active participation by the public and industry as we have pursued regulatory reform. Stakeholder feedback has been an important aspect of evaluating our regulatory programs.

We expect the preliminary results of strategic assessment and rebaselining to be available in early summer, allowing stakeholders to provide input into the decision making process. The final results will form the basis for the FY 1999 budget submission. In addition, as results become available, we plan to use them to influence the scope and direction of the FY 1998 budget submission to the greatest extent possible.

The NRC already has initiated or completed a number of activities to reform and improve its operations. I will highlight some of the more important activities and refer you to the Table in the Appendix for a summary of all activities.

IMPROVING NRC

Improvement to Reactor Regulations

The NRC has undertaken significant initiatives to improve its reactor regulatory program. Of particular note is our expanded use of probabilistic risk assessment (PRA) to ensure that the agency's resources and activities are focused on the issues that are most important to safety. In the past, the NRC has used PRA in the regulatory process with caution. As methods of analysis have evolved and become more standardized and data bases have become more reliable, the NRC has gradually expanded its use of risk assessment. A PRA Policy Statement was issued in August 1995 to state the NRC's intention to transition to a more risk-informed regulatory approach. We are currently undertaking an effort to improve NRC's review and utilization of PRA. We will develop on an expedited basis a Standard Review Plan (SRP) for use by NRC staff in conducting reviews of industry-generated individual plant examinations (IPEs), individual plant examination of externally initiated events (IPEEEs), and PRAs for use in regulatory decision-making. Our objective in developing an SRP is to ensure that NRC has criteria that are both broad in scope and generally applicable to whatever use PRAs may be put. These improvements will ensure thorough review, as well as consistent and appropriate application of such methods.

Our program for regulatory improvement also includes efforts which focus on eliminating or modifying regulations that impose substantial regulatory burden on licensees without a concomitant safety benefit. Our movement toward regulatory effectiveness will eliminate the need to compensate for outdated regulations by issuing blanket exemptions from regulations. We have asked the staff to examine closely those regulations for which we have granted multiple exemptions and to determine whether we need to change those regulations. Additionally, for individual licensees, our Cost Beneficial Licensing Action Program has reduced or eliminated requirements that have an incrementally small effect on safety but are a high economic burden. Estimates from our licensees indicate projected savings to them of more than $590 million dollars.

Improvements to Nuclear Material Regulation

The NRC has also undertaken significant initiatives in the nuclear materials regulatory program and continues to build a robust program with the States. The NRC, through its Agreement State Program, has entered into agreement with twenty-nine States to regulate byproduct, source, and certain special nuclear materials. This program has been an outstanding example of Federal/State regulatory cooperation.

The Commission has initiated a program to evaluate whether our radioactive materials program, its standards, and associated regulations are appropriately focused on the health and safety issues of significance for these licensees. As an initial step, we are reevaluating our regulation of the medical use of nuclear materials.

The NRC also is continuing its streamlining of the materials licensing and inspection processes. The objective is to use work process re-engineering to establish more efficient and automation-assisted processing of materials license and amendment requests. Similar methods will be used to improve the materials inspection process.

The NRC is continuing to work with the Environmental Protection Agency (EPA) to eliminate duplicative regulation. NRC and EPA reached an agreement on how to eliminate unnecessary dual regulation of air emissions of radionuclides under the Atomic Energy Act and the Clean Air Act. This action will provide a regulatory basis for the EPA to rescind its regulation (40 CFR 61, Subpart I). NRC is also working with other Federal agencies, including EPA, to promote consistent approaches in regulating ionizing radiation.

NRC has also completed plans for a refocused high-level waste (HLW) management prelicensing regulatory program. The program objectives focus on issue resolution, improved integration of the program, and improved efficiency of NRC and DOE interactions.

For fuel cycle facilities, NRC is continuing rulemaking and guidance development to streamline and improve efficiency, including considering rule changes to support maintenance of a "living-license" concept. The goal is to eliminate the need for time-consuming and resource-intensive periodic license renewal efforts.

Further, NRC, with industry and public involvement, is developing standard review plans for performing safety reviews of dry cask storage systems. The goal is to ensure high quality and uniformity of staff reviews by providing the basis for NRC requirements.

Improvements to Management of NRC

The NRC has made significant improvements to its own management processes from both organizational and fiscal perspectives. In partnership with the National Treasury Employees Union, we have reviewed our organizational structure and identified ways to eliminate a layer of management in both headquarters and Regions. The organizational structure of regional offices has been flattened and streamlined. The interactions and relative responsibilities between headquarters and the regions have been clarified and are under continuing review.

The NRC has worked to further improve financial operations, allowing us to increase the effectiveness and efficiency of program financing. We believe that further strengthening of the financial management of the NRC is essential to ensuring our ability to continue to meet our mission and we will be doing further work in this area.

We are confident that, although the Commission has already made improvements to some of its processes, the strategic assessment and rebaselining effort will bring a more systematic and comprehensive discipline to our reviews, which will result in further improvements and efficiencies.

NRC'S PROGRAMS

From those general remarks, I would now like to specifically address each of the NRC's major safety programs. The first of these is Nuclear Reactors.

NUCLEAR REACTORS

Operating Reactors

A critical part of our mission is the regulatory oversight of operating nuclear power plants, particularly their operational safety. Overall safety performance, reliability, and availability for U.S. power reactors during the 1990's has been good and is generally continuing to improve slowly.

Notwithstanding this trend toward improvement, operating reactors in this country are getting older, and aging affects all reactor structures, systems, and components to varying degrees and can affect operations and safety, if its effects are not controlled. The challenge is to monitor, detect, and mitigate age-related degradation through inspection, maintenance, or replacement. The NRC's maintenance rule, which becomes effective July 10 of this year, is particularly important in this regard. It is a risk-informed, performance-based rule which is structured to ensure that licensees focus on safety-important structures, systems, and components as operating plants age.

While our first priority is to ensure that nuclear plants always operate safely, we must also create an effective regulatory environment in which plants still capable of additional years of safe operation may continue to operate. The NRC has developed a sound and sensible licensing process to handle plant life extension -- 10 CFR Part 54. But within this framework, there are a number of technical problems that need to be addressed. Two that are of great importance are reactor pressure vessel embrittlement and steam generator tube integrity.

Let me address reactor pressure vessel embrittlement first. Reactor pressure vessels become embrittled due to neutron irradiation during operation. Thermal annealing has the potential to restore the material properties of the vessel to very near the original, unirradiated condition, thereby increasing the safe operating life of the reactor vessel. However, thermal annealing of a reactor vessel is a complex process which has not yet been attempted at a commercial nuclear power plant in the U.S. The NRC recently promulgated a thermal annealing rule. The Department of Energy, with industry consortia, is planning to conduct two annealing demonstrations using two different heating techniques. These projects and the first actual vessel anneal will put our regulatory framework for assessing reactor pressure vessel integrity and its technical bases to the test.

A second aging issue is steam generator tube degradation. The Commission is now considering a generic approach for dealing with steam generator tube degradation that will reduce plant specific regulatory decisions, yet ensure defense-in-depth through a balance of protection, inspection, and mitigative measures.

Standard Reactors

Although construction of new nuclear capacity in the U.S. does not appear likely at the moment, the possibility of a standard nuclear power plant as a source for new generating capacity still exists. The use of certified standard reactor designs is expected to enhance safety, reduce cost and streamline future licensing of new nuclear generation capacity. The NRC has issued final design approvals for two standard reactor designs and is in the process of certifying these designs by rulemaking. We expect that the certification of the two standard reactor designs -- the General Electric Advanced Boiling Water Reactor and the Combustion Engineering System 80+ -- for which we are currently assessing public comments, will be completed this year. The NRC is also reviewing the Westinghouse AP600 standard design application. The AP600 is a novel light water reactor design which employs passive safety features and greater use of modular construction. The NRC has issued its Draft Safety Evaluation Report for the AP600.

NUCLEAR MATERIALS AND NUCLEAR WASTE

The nuclear materials area is different from reactor regulation in that the NRC must have a regulatory program to cover a wide variety of materials licensees. Some of the issues in this area are the same as those faced by reactor licensees. Here too, licensees are under economic pressures, and when making decisions, must ensure safe and economic operations. Although the NRC continues to focus directly on the safe use of radioactive materials by approximately 7000 medical, academic,

industrial, and commercial users and an additional 38,000 general licensees, the NRC is also expanding efforts to improve our regulatory effectiveness in our relationships with other regulatory entities in the materials area. One area where improvement has been made is in the interface between NRC and the Agreement States. The Agreement State program covers approximately two-thirds of the nuclear materials licensees in the U.S. Working closely with the States, licensees, and citizen groups, the NRC developed a policy statement on Agreement State Adequacy and Compatibility with NRC regulatory programs. This policy statement will become effective after completion and Commission approval of implementing guidance. We have recognized a growing problem with radioactive sources and devices that have been improperly transferred or disposed of with the result that they have become mixed with metal scrap intended for recycling. Last year, the Commission approved formation of a joint Agreement State-NRC Working Group to review this problem and to develop recommendations for regulatory actions to improve licensee performance in this area. The Working Group has held three public meetings and two public workshops and plans to submit its report to the Commission early this summer.

United States Enrichment Corporation

The Energy Policy Act of 1992 conferred new responsibilities on the NRC to oversee the operations of the United States Enrichment Corporation (USEC). We issued the final regulations for certification of two uranium enrichment facilities in September 1994. We expect to complete our certification review later this year. The NRC will assume regulatory oversight of the facilities after completion of the first certification on USEC. In fact, we held an open public meeting on March 22, 1996 to review the status of this effort. To prepare for our regulatory oversight, we now have two resident inspectors on site at each of the facilities.

Medical Program

As an initial step in our evaluation of whether our radioactive materials program standards and regulations are appropriately focused on significant health and safety issues, the Commission is reevaluating its regulation of the medical use of byproduct radioactive materials as specified in the Atomic Energy Act. To this end, we asked the National Academy of Sciences to conduct an independent review of our regulation of the medical use of byproduct material. The National Academy of Sciences issued its report on December 14, 1995 and we are now analyzing the National Academy of Sciences Report and soliciting stakeholder feedback as we formulate our options.

High-Level Waste

The NRC continues to believe that the overall, long-term success of this nation's program to manage spent fuel and other high-level radioactive waste is dependent on developing a permanent repository for this material. In fact, the Commission's Waste Confidence decision, which is the underlying basis for continued licensing of nuclear power reactors, is predicated on the assumption that at least one mined geologic repository will be available within the 1st quarter of the 21st century. Based on what we know today, we are confident that we will be able to determine, with reasonable assurance, that spent fuel and other High-Level Waste (HLW) can be disposed of safely in a geologic repository provided: (1) that we receive a high-quality application from DOE; (2) that our requirements are met; and (3) that we can maintain our technical capabilities for licensing a deep geologic repository in the face of budget constraints. Ensuring that the NRC is prepared to review a DOE license application for a mined geologic repository in a timely manner is a Commission priority. To this end, the NRC must continue to maintain an independent regulatory research and development center, the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas.

Pending legislation (in both Houses of Congress) would place greater emphasis on the development of a centralized interim storage facility for the United States. We have already initiated actions to examine our existing licensing capabilities and staff resources were we called upon to license an interim centralized storage facility. We have, in fact, established an organization within our office of Nuclear Material Safety and Safeguards to deal with issues of spent fuel storage. The Center for Nuclear Waste and Regulatory Analysis is also important to the NRC in developing and maintaining its capability for addressing interim storage of spent fuel.

Low-Level Waste

The Low-Level Radioactive Waste Policy Act of 1980 and its subsequent amendments of 1985 gave the responsibility for identifying sites and developing disposal facilities in the United States to the States and authorized them to enter into compacts for the establishment and operation of regional disposal facilities for low-level wastes (LLW). We are presently re-examining the focus of our LLW program, since at the present time, it appears that most, if not all, LLW disposal facilities will be licensed by Agreement States.

RESEARCH

The concept of research to ensure an independent technical capability was defined by Congress in the Energy Reorganization

Act of 1974. The NRC Research program has not only provided strong technical support to the NRC, but has also provided valuable information to the industry we regulate.

In practice, NRC's research programs must also anticipate the needs of the regulators and the problems that may occur in the future in the systems that we license. We have significantly reduced the scope of our research programs over the last several years, and we are continuing to assess the required level of research effort as part of our strategic assessment and rebaselining effort. But we must ensure that an adequate technical base, which allows us to react in the event of abnormal events, is maintained.

One of NRC's most important research accomplishments is in the area of risk assessment. It is fair to say that the NRC's research program has had a major impact on the discipline of probabilistic risk assessment and particularly in its application to nuclear reactor safety.

As nuclear power plants age, we must examine the standards and operating procedures that have been imposed on critical components, such as the primary coolant system boundary, to assure ourselves and the public that an adequate safety margin still exists. One of our top research priorities is improving our understanding of the aging processes in nuclear power plants with particular focus at the present time on reactor vessels, steam generators, and electrical cables.

INTERNATIONAL SAFETY ASSISTANCE

Another challenge to which the NRC must respond is the international dimension of nuclear safety. Most recently, the NRC has worked with others, both inside the United States and in other nations, to strengthen nuclear safety worldwide, with particular emphasis on certain reactors of Soviet design. NRC's role has focused primarily on strengthening regulatory bodies in the new states of the former Soviet Union and Eastern Europe, as well as in nations in other parts of the world, particularly in Asia, who are beginning ambitious nuclear power programs. NRC has conducted a major program, funded through the United States Agency for International Development, to train regulators from the former Soviet Union and Eastern Europe on the creation or strengthening of their regulatory capabilities. We also have had extensive relationships with Gosatomnadzor (GAN) in the Russian Federation and the regulatory agency in Ukraine. We expect to continue these efforts.

One of the most critical issues facing the world community is the danger of misuse of fissionable materials in the countries of the former Soviet Union. The NRC, along with the Department of Energy and the State Department, is working closely with

counterpart organizations in Russia and Ukraine, as well as with Kazakstan, to guard against the diversion of fissionable materials. One of the United States government's priorities has been to assist the Russian government in developing adequate materials protection, control, and accounting procedures, and in acquiring relevant technology. The NRC has been working closely with both Russian and Ukrainian regulators, and with the Russian government at the highest levels, to help develop the necessary statutory framework to provide their regulatory bodies with the requisite authority and access to protect their nuclear materials properly.

Another long-standing international activity of the NRC has been in the area of regulatory research -- an area likely to assume even greater significance in the future. NRC has extensive research agreements with organizations in many foreign countries. This cooperative approach not only makes good economic sense--through the pooling of increasingly scarce resources--but recognizes the inherently international character of the nuclear business.

In the wake of the Three Mile Island and Chernobyl accidents, nuclear operators recognized the imperative of combining their national efforts in the cause of enhanced safety. We believe the world's nuclear regulators should consider establishing a better mechanism for coordinating their own efforts, which could provide a more regular forum for the exchange of relevant information and views on topics of mutual interest. We know that significant exchanges already take place on an ad hoc basis. However, these efforts do not always reflect the needs of regulators or their priorities. Nuclear safety must remain the responsibility of the nations in which the technology is utilized. However, a more focused forum of nuclear regulators on the international level should identify common themes and approaches and provide greater support for safety. It is an idea the Commission will be exploring with our regulatory counterparts in other nations in the near future, and with the Executive Branch.

FISCAL YEAR 1997 BUDGET

Our budget request for fiscal year 1997 is $480.3 million. This represents only a $7 million increase over FY 1996. That is less than the projected rate of inflation. This very small increase is being driven by two things. First, as noted earlier, the Agency plans to undertake new responsibilities associated with the Department of Energy (DOE), beginning in FY 1997. These involve the anticipated commercial vitrification of the HLW in the Hanford tanks, and commercial tritium production in light-water reactors. Second, we believe it is essential to maintain the technical capabilities the NRC will need for reviewing a license application from DOE for a HLW repository.

The details of our budget request for fiscal year 1997 have been provided to your Committee. That request is summarized by program in the chart as an Appendix to this testimony.

As noted earlier, the NRC has, since 1993 been on a trend of decreasing staff resources. However, consistent with direction from this committee in its report on the NRC's FY 1996 appropriations, we have accelerated the planned staff reductions for FY 1997, resulting in a level of 3,120 FTE in lieu of the 3,144 FTE previously planned under the Federal Workforce Restructuring Act (FWRA).

With regard to funding trends, the NRC's FY 1997 budget request reflects an 11 percent reduction when compared to FY 1993. When the effects of inflation are considered, this is a 20 percent reduction in buying power. Notwithstanding this reduction, we are clear that our foremost responsibility is public health and safety. We, therefore, must make our programmatic decisions based on this responsibility. We are, however, sensitive to the economic burden which NRC fees place upon our licensees.

The NRC has taken action to allocate the cost of accomplishing its mission in a fair and equitable way among the broadest base of NRC licensees. Because under current law we cannot charge DOE fees for the 1997 work, we have included language in our proposed FY 1997 appropriation legislation to exempt the resources for the DOE Hanford tank work from the 100 percent fee requirement. The Commission will continue to work with the Congress toward the objective of making fees as fair and equitable as possible.

In addition, as noted earlier, a strategic assessment and rebaselining of NRC has been initiated. Our objective is to ensure that we are expending the minimum level of resources required and yet ensure that we fulfill our regulatory responsibilities.

In its report on the NRC's FY 1996 appropriations, the committee also observed that the Commission should reduce its levels of unobligated balances and undelivered orders. The Commission understands the committee's concern and has a goal to reduce unobligated balances and undelivered orders (unliquidated obligations) at the end of the fiscal year to acceptable levels. We believe that good fiscal management and expenditure of funds on only sound program needs should be guiding principles and we intend to aggressively pursue any further improvements that are needed to ensure that NRC's financial management is sound.

In recognition of our fiscal responsibility, the NRC has taken actions to reduce the level of unobligated balances in an orderly manner. Specifically, we suggested a rescission during FY 1994, which the Congress enacted. We suggested a reduction to our proposed FY 1995 appropriation, which Congress also enacted. We are using FY 1995 unobligated balances to facilitate the

transition to a lower level of funding in FY 1996 while still permitting the Agency to adequately fulfill our public health and safety mission.

I want to make one final point regarding our budget--the extension of the requirement for NRC to collect 100 percent fees over the period of FY 1999 through FY 2002 and the scoring of the resulting receipts. Current law requires the NRC to recover, for fiscal years 1991 through 1998, approximately 100 percent of its budget authority (less the amount appropriated from the Nuclear Waste Fund) by assessing fees to NRC applicants and licensees. Such receipts from license fees have been scored as discretionary receipts and used by the Committee to offset the NRC's appropriation. Thus, the NRC cost to regulate the nuclear industry is offset by the fees our licensees are required to pay. We understand that, as part of current balanced budget proposals, consideration is being given to extending the 100 percent fee recovery requirement and changing the current method of scoring NRC receipts from fees. Reportedly, the proposed revision would result in only one-third of the fees paid by the NRC licensees being scored as discretionary beginning in FY 1999. The remaining two-thirds would be scored as mandatory, for FY 1999 through FY 2002, and these fees would be used as additional revenue to fund other government programs, instead of offsetting NRC costs. As you are aware, the 100 percent fee recovery requirement has been controversial even when the funds are used to fully offset the services to the fee payers. The proposed change in scoring would increase the concerns already presented by the nuclear licensees and license applicants.

CONCLUSION

In conclusion, we take very seriously our responsibilities to ensure adequate protection of the public health and safety in the use of nuclear materials in the United States. At the same time, we are sensitive to the need to contain the NRC's costs of doing business. We believe that the resources requested in our FY 1997 budget are necessary to achieve those objectives.

We greatly appreciate the support for NRC's programs which you have afforded us in the past; we hope to continue to benefit from this support. In the Commission's view, these programs are necessary to ensure effective regulation of industries which touch virtually every facet of American life.

Mr. Chairman, this concludes my prepared statement. My fellow Commissioners and I will be pleased to answer any questions that you and the Committee may have.

U.S. NUCLEAR REGULATORY COMMISSION
BUDGET SUMMARY
(Dollars in Millions)

	FY 1996	FY 1997 Request
REACTOR PROGRAM		
Reactor Regulation	213.3	220.5
Standard Reactor Designs	19.9	14.4
Test and Research Reactors	2.1	2.2
Subtotal	235.4[1]	237.1
NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM		
Fuel Facilities	11.1	15.0
Material Users	29.3	30.6
Low-Level Waste and Decommissioning	16.8	16.4
Other Nuclear Materials and Waste Activities	7.0	7.3
High-Level Waste	11.0	14.0
Subtotal	75.2	83.3
MANAGEMENT AND SUPPORT PROGRAM		
Policy and Direction	17.2	17.9
Resource and Administration	128.3	125.9
Special Technical Programs	12.2	11.1
Subtotal	157.7	154.9
INSPECTOR GENERAL	5.0	5.0
TOTAL	473.3	480.3

[1] Components do not add to total due to rounding.

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Improvements to Reactor Regulation	
Regulations for Reactor Licensing: License Renewal - Issued final License Renewal Rule Revised licensing process including early site permit, standard design certification, and combined construction permits and operating licenses. - Issued proposed certification rules for ABWR and System 80+ designs	Review utility programs implementing license renewal rule Final design certification rulemakings for ABWR and System 80+

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
"Marginal to Safety" Initiative: Process in place to identify, review and revise regulations that provide only marginal safety benefit yet impose significant costs Goal: To eliminate the regulation altogether, or to revise the regulation to eliminate prescriptiveness and incorporate risk-based and performance oriented concepts Identified a number of regulations. During FY 93 and 94 nearly 60% of our final rules involved reduction of burden or added flexibility for licensees such as elimination of reporting requirements and reduction on testing and surveillance requirements. Example: Issued final revision to containment leakage testing regulations in which use of risk analysis is used as a means for justifying extension of the containment leak rate test for an industry-wide savings of an estimated $600 to $800M during the lifetime of the facilities.	Incorporating risk-based and performance oriented concepts into specific regulations In FY 95-96 we anticipate approximately 50% of our proposed rules will involve reduction of burden or added flexibility for licensees.

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Use of probabilistic risk assessment (PRA) techniques in development and revision of regulations, operational event assessments, the individual plant examination program, in which all commercial reactor licensees are performing PRAs in order to identify any severe accident vulnerabilities needing attention; review of advance reactor designs, and expedited processing of license amendments that eliminate unnecessary requirements This use of risk assessment has focused licensees' and applicants' attention on evaluating and correcting the significant adverse conditions that are identified and allowed NRC to eliminate unnecessary requirements. The overall objective is to transition to a more risk-informed and performance-oriented regulatory system. A PRA Policy Statement was issued in August 1995 to establish a conceptual level framework for additional regulatory improvements. Pilot application of the Maintenance Rule to nine nuclear power plants. Revisions to 10 CFR 50, Appendix J, containment leak rate testing requirement Review of all IPE submittals and issued 45 Evaluation Reports	Expedited development of regulatory guidance documents to provide consistent methods and criteria for risk-informed regulatory activities. Technical assessments of industry initiatives for near term application of risk-informed approaches. These include the following initiatives under the PRA Implementation Plan: . Quality Assurance . Inservice Testing . Inservice Inspection . Technical Specification modifications Additional activities for increasing PRA use include: . Enhancements to reactor inspection program to make it more risk-focused and effective . Enhanced PRA training for NRC staff Complete remaining IPE Evaluation Reports

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Regulatory Review Group reexamination of regulations, processes, programs, and practices Identification of key areas in which substantive burden could be reduced for licensees, staff, or both, without adversely impacting safety at operating plants. During CY 95, completed implementation of 17 Regulatory Review Group recommendations. As of the end of CY 95, 60 percent of the recommendations were completed.	Implementation of remaining Regulatory Review Group recommendations.
Technical Specification Improvement Program eliminates unnecessary license constraints, thereby substantially reducing the regulatory burden on licensees. Improved standard technical specifications (STS), which reflect application of the criteria added to 10 CFR 50.36 and other programmatic improvements, were published to provide guidance to licensees for adoption in existing licenses (NUREG 1430-1434). 12 conversions to improved standard technical specifications completed (as of 03/96) - savings for completed conversions estimated to be between $150K to $1M per unit per year. Line item improvement provision exists whereby a licensee may request that only a portion of the STS be implemented.	Further improvements to the STS, including lessons from conversion applications, are processed in coordination with an industry task force as periodic revisions to the associated NUREG reports. License amendment applications for conversion to the improved STS are processed as the highest priority licensing actions. Guidelines for adopting significant portions of the improved STS are published as Generic Letters or Administrative Letters.

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Development and publication of a Probabilistic Risk Assessment Policy Statement to delineate the policy to be used for consistent and predictable use of probabilistic risk assessment methods in the regulatory process. Development of a risk-based methodology for assessing the reliability of key safety systems using available operating experience. Development of a common-cause failure data base for estimated common-cause parameters of key components. Implemented improved methodology for identifying and ranking the risk significance of actual operating events. Published a proposed rule to obtain key safety system reliability and availability data from actual operating experience for use in risk-informed performance-based regulation. A greatly expanded PRA training program has been established to increase the knowledge, skills, and abilities of NRC staff to support risk-informed, performance-based regulation. This includes a special program to develop skills at the advanced level for a new group of Senior Reactor Analysts.	Continuing to work with industry to obtain key safety system reliability and availability data from industry on a voluntary basis, thus conserving both industry and NRC resources. Developing risk-based reactor plant Performance Indicators for use in assessment of licensee performance. Increased use of utility self-assessments - Industry learned from NRC Diagnostic Evaluations and is now capable of effective self-assessments. Also, NRC now integrates results of routine inspections to assess utility performance (IPAPs).
Cost beneficial licensing actions process for review in place During CY 95, approved 115 licensee requests for cost-beneficial licensing actions, resulting in a licensee-estimated lifetime savings of approximately $235 million.	Continue to review and approve cost beneficial licensing actions as requested

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Improvements to Nuclear Materials Regulation	
The NRC, through its Agreement States Program, has entered into agreement with twenty-nine States to regulate byproduct, source, and certain special nuclear materials.	Include additional States Continue to build robust regulatory program with States: Implementing Procedures for Agreement State Compatibility Policy Statement Agreement State and NRC Region Materials Program Assessments Using Common Indicators and Performance Oriented Approach
Reevaluation of the medical use of Atomic Energy Act materials National Academy of Sciences (NAS) conducted an independent review of NRC's regulation of the medical use of byproduct material and issued its report on December 14, 1995	Reevaluation of the medical use of Atomic Energy Act materials NRC is analyzing the NAS report and is soliciting stakeholder feedback as we formulate our opinions
Business Process Reengineering for materials licensing NRC has completed the analytical phase of the project and has prepared a conceptual design of a fundamentally new and streamlined approach to materials licensing	Business Process Reengineering being applied to materials licensing and inspection process Design, develop, and test the new materials licensing process. Goal: establish more efficient and potentially automation assisted processing of materials license and amendment requests

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Completed plans for a refocused high-level waste management prelicensing regulatory program. The program is restructured around 10 key technical issues. The refocused objectives of the program include a developed "vertical slice approach" to focus on issue resolution, improved integration of the program, improved efficiency of NRC and DOE interactions. NRC has also prioritized activities within a reduced budget and has prepared detailed implementation plans for staff and contractor support	Implement refocused high-level waste management prelicensing regulatory program. Assess and adjust as necessary
Elimination of duplicative EPA/NRC Regulations EPA rescinded air emission standards from commercial mill tailings disposal facilities, and NRC and EPA developed groundwater protection standards at inactive uranium mill tailings sites and agreed on an approach to resolve the need for independent and duplicative EPA reviews of ground water protection actions that are already being reviewed and approved by NRC. EPA rescinded its Subpart I standard for nuclear power reactors in 1995 based on review of NRC's existing program	EPA/NRC cooperation to eliminate duplicative regulation NRC and EPA reached an agreement on how to eliminate unnecessary dual regulation of air emissions of radionuclides under the Atomic Energy Act and the Clean Air Act. NRC is proposing to amend its regulations to include a constraint on the dose from air emissions and if finalized EPA has proposed to rescind its air emissions standards for licensed nuclear facilities other than power reactors NRC has worked with other Federal agencies, including EPA, in 1995 to establish the Interagency Steering Committee on Radiation Standards (ISCORS) to promote consistent approaches in regulating ionizing radiation. Under ISCORS, which is co-chaired by NRC and EPA, the agencies are working on specific issues, including risk harmonization, contamination cleanup, recycling of contaminated material, mixed waste, and sewer contamination.

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Adopted a new performance based licensing approach for uranium recovery facilities. This approach provides licensees more flexibility in the way they meet the conditions of their licenses, and allows licensees to make changes to their facilities or operations under certain conditions, without NRC review and license amendment	NRC, with industry involvement, is considering rule changes that would support maintenance of a "living-license" concept for fuel cycle facilities. Goal: eliminate the need for time-consuming and resource-intensive periodic license renewal efforts Business process reengineering being applied to the spent fuel transportation and storage licensing process. Goal: Model current licensing process and provide recommendations, as necessary, to improve efficiency and effectiveness. NRC, with industry involvement, is developing standard review plans for performing safety reviews of dry cask storage systems. Goal: Ensure the quality and uniformity of staff reviews and provide basis for review scope and requirements Developing comprehensive changes to the materials decommissioning program. Goal: Improve efficiency and effectiveness and apply greater attention to poor performers to better manage the risk at sites

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Improved the exchange of nuclear materials event and problem information among NRC organizations and Agreement States. Established and initiated implementation of a Nuclear Materials Event Database for use by the NRC and Agreement States. Implemented a trial voluntary program for Agreement State Reporting of Nuclear Materials Events. Training programs for NRC and Agreement State nuclear materials inspectors are being merged into a common core of courses that are co-attended by both groups in order to increase consistency in nuclear materials regulation. A new fuel cycle curriculum has been developed in support of the transfer of oversight responsibilities for gaseous diffusion plants from DOE to NRC in accordance with 10 CFR Part 76.	Continue to assess, improve, and use the Nuclear Materials Event Database for improving safety of the use of nuclear materials.
Improvement to Management of NRC	
	Strategic Assessment and Rebaselining initiative to comprehensively address the changing regulatory environment and provide a guide for the agency's activities and decisionmaking in the future. Specifically reassessing agency activities and evaluating the basic nature of agency work and the means by which the work is accomplished. Identification of management areas for improvement will come as a result of this process.

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Labor Management Partnership Committee formation Major Program Office Reorganizations Number of supervisors and managers reduced by 21% from 702 in September 1993 to 554 in January 1995 Supervisor/manager to employee ratio reduced from 1:4 to 1:5 Consolidations of Regions IV and V saves over $9M over the next 5 years Closed Uranium Field Recovery Office saves about $450K annually	Regional Office reorganizations Planned reorganizations will improve supervisor/manager to employee ratio through the end of FY 1999
Procurement Process Reinvention Financial Management Process improvements contributed to NRC's ability to propose a $12.7M rescission in FY94 appropriation and to absorb a $20M reduction to the FY95 budget request, and a $52M reduction to the FY96 budget request.	
In FY 1995, the NRC took certain actions in its final fee rule to streamline and simplify the fee structure for its licensees to make fees more fair and equitable, and to accelerate the fee billings.	In FY 1996, to stabilize annual fees and to further streamline fees, the NRC will eliminate the materials "flat" renewal fees in 10 CFR Part 170 by including the costs of renewals in certain materials licensees' 10 CFR Part 171 annual fees.
NRC streamlined its management control program to reinforce the concept that management control is an integral part of day-to-day management and controls should be designed to benefit managers, not encumber them.	

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	**ONGOING ACTIONS**
Adopted and implemented approximately half of the recommendations from the review team for reassessment of the NRC's program for protecting allegers against retaliation. Completed a comprehensive review and revision of the NRC's Enforcement Program to provide additional emphasis on discouraging retaliation for raising safety concerns and encouraging corrective action by licensees before government intervention when discrimination occurs.	Publishing a revised directive on handling allegations and a Commission policy statement on encouraging the industry to provide an environment conducive to raising safety concerns. These two documents implement the majority of the remaining review team recommendations. Publishing data on allegations received by the NRC. Developing a new software package for tracking and trending allegations. Publishing a brochure describing the NRC's allegation process and the protection available to allegers.
Launched agency-wide public responsiveness initiatives Developed public responsiveness improvement plans Issued Final Report on Responsiveness to the Public which expanded agency initiatives to be more open and responsive to the public	

REFORMING NRC OPERATIONS - COMPLETED AND ONGOING ACTIONS	
COMPLETED ACTIONS	ONGOING ACTIONS
	Interaction with States and utilities (State Outreach Program) is effective in improving emergency response capabilities. Improved interaction with FEMA, NOAA, DOE, and other Federal Agencies in the Emergency Response area. Enhanced use of information technology to improve public responsiveness and internal efficiencies; in particular, Internet has been used to provide information to the general public, and Plant Information Books for all operating reactors are available through the World Wide Web.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Office of Public Affairs
Washington, D.C. 20555

DR. SHIRLEY ANN JACKSON

The Honorable Shirley Ann Jackson, Chairman of the U.S. Nuclear Regulatory Commission, is a theoretical physicist. She was sworn in as a Commissioner on May 2, 1995 and assumed the Chairmanship two months later, on July 1. Prior to joining the NRC, she had extensive experience as a university professor, research scientist, consultant and corporate director.

A native of Washington, D.C., she graduated from Roosevelt High School in 1964, as class valedictorian. Matriculating at Massachusetts Institute of Technology in Cambridge, Mass., she earned a Bachelor of Science degree in physics in 1968 and a Ph.D. in the field of theoretical elementary particle physics in 1973.

From 1991 to 1995, Dr. Jackson was a Professor of Physics at Rutgers University in Piscataway, N.J., serving concurrently as a consultant in semiconductor theory to AT&T Bell Laboratories in Murray Hill, N.J.

For 15 years, from 1976 until 1991, when she joined the Rutgers faculty, Dr. Jackson conducted research in theoretical physics, solid state and quantum physics, and optical physics at AT&T Bell Laboratories.

Dr. Jackson is a Fellow of the American Academy of Arts and Sciences, is a Fellow of the American Physical Society, and is a member of a number of other professional organizations.

She has served on the board of directors of Public Service Enterprise Group and its subsidiary, Public Service Electric and Gas Company, Sealed Air Corporation, CoreStates Financial Corporation, CoreStates New Jersey National Bank, and New Jersey Resources Corporation.

She is a Life Member of the M.I.T. Board of Trustees. She has served on an advisory panel to the Secretary of Energy on the future of Department of Energy national laboratories, served on research councils of the National Academy of Sciences and on the Advisory Council of the Institute of Nuclear Power Operations (INPO). Dr. Jackson has also served on a number of high level commissions in the state of New Jersey.

Dr. Jackson has achieved a number of firsts in her career. She was the first African-American woman to receive a doctorate from M.I.T.--in any subject; she was the first African-American to become a Commissioner of the NRC; she was the first woman and the first African-American to serve as Chairman of the Commission.

Dr. Jackson is married to Dr. Morris A. Washington, also a physicist. They have one son, Alan.

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February 1996

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Office of Public Affairs
Washington, D.C. 20555

KENNETH C. ROGERS

Kenneth C. Rogers was sworn in for a second five-year term as a member of the Nuclear Regulatory Commission on June 12, 1992. Before his first-term nomination by President Reagan and confirmation by the Senate in 1987, Dr. Rogers served as president of Stevens Institute of Technology for 15 years.

He joined Stevens in 1957 following research appointments at Cornell University. At Stevens he served the college as a professor, head of the physics department, dean of the faculty and acting provost before becoming its president in 1972. He has held appointments at Princeton University and the City University of New York concurrent with his Stevens positions. In 1987 he was designated President Emeritus at Stevens.

A physicist by training, Dr. Rogers' technical areas of expertise include plasma physics, particle accelerators, optical spectroscopy, elementary particle physics and nuclear instrumentation. He is the author of more than 30 technical papers, and two patents.

Dr. Rogers was appointed by the Governor as a member of the New Jersey Commission on Science and Technology and is a member of numerous professional societies, including the American Physical Society and the American Nuclear Society, and is a Senior Member of the Institute of Electrical and Electronics Engineers. He is a Fellow of the American Association for the Advancement of Science.

He has served as a Director of the Public Service Enterprise Group (formerly Public Service Electric and Gas Company of New Jersey) and was a charter member of the Board of Director's Nuclear Oversight Committee. He has been a Director of the First Jersey National Bank as well as a Trustee of the Christ Hospital, Jersey City, NJ; the Association of Independent Colleges and Universities in New Jersey; the Independent College Fund of New Jersey; and the Hoboken (NJ) Chamber Orchestra.

He received a bachelor of science degree in physics from St. Lawrence University (1950) and a master of arts degree in physics (1952) and doctor of philosophy degree in physics (1956) from Columbia University. He was awarded an honorary doctorate degree by St. Lawrence University in 1983 and by Stevens Institute of Technology in 1987. He was the first recipient of the Hudson County (NJ) Humanitarian Award of the National Conference of Christians and Jews in 1985.

Born in Teaneck, New Jersey, Dr. Rogers and his wife Katharine have three children.

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September 1992

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Office of Public Affairs
Washington, D.C. 20555

GRETA JOY DICUS

The Honorable Greta J. Dicus, Commissioner of the U.S. Nuclear Regulatory Commission (NRC), is a radiation biologist from Arkansas. She was sworn in as a Commissioner on February 15, 1996. Prior to joining the NRC, Ms. Dicus has had extensive experience as a health physicist, research scientist, medical school instructor, radiation health director, and corporate board member.

Ms. Dicus was confirmed by the U.S. Senate as a member of the Board of Directors of the United States Enrichment Corporation from March 1994 to March 1995.

From 1980 to 1995, Ms. Dicus worked in progressively responsible positions in the Division of Radiation Control and Emergency Management at the Arkansas Department of Health. She was Chief of Licensing from 1982 to 1984 and was Director of the Division for nine years thereafter.

Concurrently, from 1991 to 1993, she served as Chairman of the Central Interstate Low-Level Radioactive Waste Commission. She also served on the Southern States Energy Board's (SSEB) Advisory Committee on Transportation of Radioactive Materials and the SSEB's TRU Waste Working Group.

For 16 years, from 1961 to 1977, Ms. Dicus conducted research in radiation health effects at Harvard Medical School, Rice University, the University of Texas, and Southwestern Medical School. She published several papers detailing her studies. During this time period, Ms. Dicus also instructed nursing students in biology, from 1974 to 1977, at Garland County Community College and graduate students in radiobiological research, from 1966 to 1968, at Southwestern Medical School.

An Arkansas native, Ms. Dicus was educated in Texas. She graduated with a Bachelor of Arts degree in biological sciences from Texas Woman's University in 1961 and earned a Master's Degree in radiation biology from the University of Texas Southwestern Medical School in 1967.

Among her appointments, Ms. Dicus has served as the Arkansas Department of Health Emergency Services Liaison Officer to Arkansas' Office of Emergency Services, Arkansas' Liaison with the NRC, Alternate Commissioner and later as Commissioner of the

Central States Low-Level Waste Compact Commission, and member of the Governor's Low-Level Radioactive Waste Advisory Group.

Ms. Dicus has been a member of the Health Physics Society, Sigma Xi, and the Conference of Radiation Control Program Directors.

February 1996

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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JAMES M. TAYLOR

James M. Taylor was named Executive Director for Operations of the Nuclear Regulatory Commission in December 1989. The Executive Director for Operations is the chief staff official of the NRC, managing day-to-day operations of the agency and reporting directly to the Commission.

Mr. Taylor was named Deputy Executive Director for Nuclear Reactor Regulation, Regional Operations and Research in January 1989. Since April 1987, he had served as Deputy Executive Director for Regional Operations and Acting Deputy Executive Director for Operations.

He joined the NRC in May 1980 and since then has served in positions of increasing responsibility, becoming Deputy Director of the Office of Inspection and Enforcement in October 1983 and Director of that Office in January 1985.

In 1989, he received the Distinguished Senior Executive award, the highest award of the Federal Government's Senior Executive Service.

Immediately prior to joining the NRC staff, he served in the Office of Naval Reactors as Associate Director of the Department of Energy's High Speed Submarine Projects, after earlier serving 20 years as an engineering duty officer in the U.S. Navy Nuclear Power Program.

Mr. Taylor is a 1956 graduate of the U.S. Naval Academy where he earned a Bachelor of Science degree. In 1961, he earned a Master of Science and Engineer's degree from the Massachusetts Institute of Technology.

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February 1990

UNITED STATES
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KAREN D. CYR

On July 2, 1994, Karen D. Cyr became General Counsel of the Nuclear Regulatory Commission.

Ms. Cyr is a 1970 graduate of Iowa State University. Following graduate study in political science at the University of North Carolina, she earned a law degree from Duke University in 1977. Ms. Cyr's service in the legal aspects of the nation's nuclear program began in 1977 when she joined the staff of the Nuclear Regulatory Commission. Among the positions she has held are Enforcement Attorney in the Office of NRC's Executive Legal Director, 1977-1986; Legal Assistant to the Atomic Safety and Licensing Appeal Panel, 1979; Senior Rulemaking Attorney in the Office of the General Counsel, 1988-1989; Legal Assistant to Chairman Kenneth M. Carr, 1989-1991; Legal Counsel and Chief of Staff to Chairman Ivan Selin, 1991-1993; Associate General Counsel, 1993, and Deputy General Counsel for Hearings, Enforcement and Administration, 1993-1994, in the Office of the General Counsel.

February 1995

UNITED STATES
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LEO J. NORTON

Leo J. Norton was appointed Acting Inspector General in September 1995.

The duties of the Inspector General include supervising and coordinating audits and investigations of all NRC programs and operations and keeping the NRC Chairman and Congress full informed of fraud, abuses and deficiencies relating to the administration of those programs and operations.

Mr. Norton first joined the Office of the Inspector General in November 1989 as Assistant Inspector General for Investigations.

Mr. Norton graduated from Lasalle University in 1968. He earned a law degree from Temple University in 1974 and was admitted to the U.S. Supreme Court in 1981.

Previously he was with the General Accounting Office, Office of Special Investigations, 1987-1989; Office of Investigations, NRC, 1983-1987; and was Attorney-Inspector at the U.S. Postal Inspection Service, 1979-1983.

In 1993, Mr. Norton received the Presidential Meritorious Rank Award.

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MARCH 1996

UNITED STATES
NUCLEAR REGULATORY COMMISSION
Office of Public Affairs
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RONALD M. SCROGGINS

Ronald M. Scroggins was appointed Controller of the Nuclear Regulatory Commission (NRC) in February 1982. In December 1991, Mr. Scroggins was also designated as the NRC's Deputy Chief Financial Officer. As the Deputy Chief Financial Officer/Controller, Mr. Scroggins is responsible for the management of all accounting, budgeting and other financial activities of the agency.

Mr. Scroggins first joined the former Atomic Energy Commission (AEC) in March 1960 as a Chemical Engineer in the Division of Reactor Development. Since that time, he has held progressively responsible positions at the AEC/NRC, including Chief, Systems Engineering Branch, Division of Reactor Safety Research. In August 1978, he was appointed Director, Administration and Resource Control Staff, Office of Nuclear Regulatory Research.

Prior to joining the AEC/NRC, Mr. Scroggins served as a reactor engineer with Babcock and Wilcox from July 1957 to March 1960.

Mr. Scroggins received a bachelor of science degree in chemical engineering from Wayne State University in 1957.

In 1990, Mr. Scroggins received the Presidential Meritorious Rank award.

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March 1992

NUREG-1100
Volume 12

BUDGET ESTIMATES FISCAL YEAR 1997

March 1996

U.S. Nuclear Regulatory Commission

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SUMMARY

INTRODUCTION

The U.S. Congress has determined that the safe use of nuclear materials for peaceful purposes is a legitimate and important national goal. It has entrusted the Nuclear Regulatory Commission (NRC) with the primary Federal responsibility for achieving that goal. The NRC's mission, therefore, is to ensure adequate protection for the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States.

The NRC's scope of responsibility includes regulation of commercial nuclear power plants; research, test, and training reactors; fuel cycle facilities; medical, academic, and industrial uses of nuclear materials; and the transport, storage, and disposal of nuclear materials and wastes. The NRC carries out its mission by setting standards and requirements that licensees must meet to design, construct, and operate safe facilities, in the form of rules, license conditions, and regulatory guidance; inspecting facilities and taking enforcement action, as necessary, to ensure that such standards are followed; and conducting research to support, confirm, or refine judgments used in regulatory decisions. The technologies involved in the use of nuclear energy are relatively new and complex. Regulatory decisions must often be conservative to account for technical uncertainty. These conservative decisions should be modified appropriately as increased understanding of physical phenomena and interactions is achieved. Further, essential functions must be maintained through appropriate combinations of high component and system reliability, redundancy, and diversity to provide multiple barriers to the release of radiation (defense-in-depth).

ALL DOLLAR AMOUNTS IN THIS DOCUMENT REPRESENT BUDGET AUTHORITY ENACTED FOR FY 1995, ESTIMATED FOR FY 1996 AND REQUESTED FOR FY 1997.

BUDGET SUMMARY

(Dollar amounts in tables represent thousands of dollars ($K). In text, whole dollar amounts are used. Staff numbers represent full-time equivalents (FTEs).)

FUNDS: The Nuclear Regulatory Commission's (NRC's) Fiscal Year (FY) 1997 budget request is $480,300,000. This is an increase of $7,000,000 above FY 1996.

FTE: The NRC's FY 1997 budget request is 3,120 FTEs. This is a decrease of 40 FTEs below the FY 1996 level.

TOTAL NRC BUDGET AUTHORITY BY APPROPRIATIONS

			FY 1997 Estimate	
	FY 1995 Enacted[1]	FY 1996 Estimate	Request	Change from FY 1996
NRC Salaries and Expenses (S&E) Appropriations ($K)				
Salaries and Expenses	518,791	468,300	475,300	7,000
Offsetting Fees Receipts	496,791	457,300	457,800	500
Net Appropriated - S&E	22,000[2]	11,000[2]	17,500[3]	6,500
NRC Office of Inspector General (IG) Appropriations ($K)				
Inspector General	5,080	5,000	5,000	0
Offsetting Fees Receipts	5,080	5,000	5,000	0
Net Appropriated - IG	0	0	0	0
Total Net Appropriated - NRC	22,000	11,000	17,500	6,500

[1]FY 1995 Salaries and Expenses appropriations account: $1.71 million rescinded pursuant to P.L. 104-19, Emergency Supplemental, Disaster Assistance, and Rescissions Act, 1995.

[2]Appropriated from the Nuclear Waste Fund.

[3]$14 million appropriated from the Nuclear Waste Fund and $3.5 million appropriated from general funds.

APPROPRIATIONS AND FINANCIAL SUMMARY

The NRC's FY 1997 budget requests new budget authority of $480,300,000 to be funded by two appropriations -- one is NRC's Salaries and Expenses appropriation for $475,300,000, and the other is NRC's Office of Inspector General appropriation for $5,000,000. Of the funds appropriated to the NRC's Salaries and Expenses, $14,000,000, shall be derived from the Nuclear Waste Fund and $3,500,000 shall be derived from general funds. Proposed appropriation language on the use of funds derived from the Nuclear Waste Fund and from the general funds are discussed on page 8, item 10, and page 11, item 14, respectively. The proposed FY 1997 appropriation legislation would also exempt the $3,500,000 for the Department of Energy work related to commercial vitrification of high-level waste from the requirement that NRC collect 100 percent of its budget from fees. The sums appropriated to the NRC's Salaries and Expenses and NRC's Office of Inspector General shall be reduced by the amount of revenues received during FY 1997 from licensing fees, inspection services, and other services and collections, so as to result in a final FY 1997 appropriations for the NRC at an estimated $17,500,000 -- the amount appropriated from the Nuclear Waste Fund and from general funds. Revenues derived from enforcement actions will be deposited to miscellaneous receipts of the Treasury.

The NRC's FY 1997 appropriations legislation and its accompanying analysis are provided on pages 4 through 14 of this section. This section also provides summaries for budget authority by function and by program, a summary of staffing by program, changes in budget authority by program, and an explanation of resource changes by program. The detailed justifications for direct program activities are presented on pages 22 through 142. It should be noted that the funds related to the reimbursable program are not financed by NRC's appropriated funds, but solely through reimbursable agreements with other Federal agencies and non-Federal entities.

SUMMARY

PROPOSED FY 1997 APPROPRIATIONS LEGISLATION

The proposed appropriations legislation is as follows:

Salaries and Expenses

For necessary expenses of the Commission in carrying out the purposes of the Energy Reorganization Act of 1974, as amended, and the Atomic Energy Act of 1954, as amended, including the employment of aliens; services authorized by 5 U.S.C. 3109; publication and dissemination of atomic information; purchase, repair, and cleaning of uniforms; official representation expenses (not to exceed $20,000); reimbursements to the General Services Administration for security guard services; hire of passenger motor vehicles and aircraft; $475,300,000 to remain available until expended, of which $14,000,000 shall be derived from the Nuclear Waste Fund: Provided, That from this appropriation, transfers of sums may be made to other agencies of the Government for the performance of the work for which this appropriation is made, and in such cases the sums so transferred may be merged with the appropriation to which transferred: Provided further, That moneys received by the Commission for the cooperative nuclear safety research program, services rendered to foreign governments and international organizations, and the material and information access authorization programs, including criminal history checks under section 149 of the Atomic Energy Act of 1954, as amended, may be retained and used for salaries and expenses associated with those activities, notwithstanding 31 U.S.C. 3302, and shall remain available until expended: Provided further, That revenues from licensing fees, inspection services, and other services and collections estimated at $457,800,000 in fiscal year 1997 shall be retained and used for necessary salaries and expenses in this account, notwithstanding 31 U.S.C. 3302, and shall remain available until expended: Provided further that the funds herein appropriated for regulatory reviews and other activities pertaining to waste stored at the Hanford site shall be excluded from license fee revenues, notwithstanding 42 U.S.C. 2214: Provided further, That the sum herein appropriated shall be reduced by the amount of revenues received during fiscal year 1997 from licensing fees, inspection services, and other services and collections, excluding those moneys received for the cooperative nuclear safety research program, services rendered to foreign governments and international organizations, and the material and information access authorization programs, so as to result in a final fiscal year 1997 appropriation estimated at not more than $17,500,000.

SUMMARY: Proposed FY 1997 Appropriations Legislation

Office of Inspector General

For necessary expenses of the Office of Inspector General in carrying out the provisions of the Inspector General Act of 1978, as amended, including services authorized by 5 U.S.C. 3109, $5,000,000, to remain available until expended; and in addition, an amount not to exceed 5 percent of this sum may be transferred from Salaries and Expenses, Nuclear Regulatory Commission: Provided, That notice of such transfers shall be given to the Committees on Appropriations of the House and Senate: Provided further, That from this appropriation, transfers of sums may be made to other agencies of the Government for the performance of the work for which this appropriation is made, and in such cases the sums so transferred may be merged with the appropriation to which transferred: Provided further, That revenues from licensing fees, inspection services, and other services and collections shall be retained and used for necessary salaries and expenses in this account, notwithstanding 31 U.S.C. 3302, and shall remain available until expended: Provided further, That the sum herein appropriated shall be reduced by the amount of revenues received during fiscal year 1997 from licensing fees, inspection services, and other services and collections, so as to result in a final fiscal year 1997 appropriation estimated at not more than $0.

SUMMARY

ANALYSIS OF PROPOSED FY 1997 APPROPRIATIONS LEGISLATION

The analysis of the proposed appropriations legislation is as follows:

Salaries and Expenses

1. FOR NECESSARY EXPENSES OF THE COMMISSION IN CARRYING OUT THE PURPOSES OF THE ENERGY REORGANIZATION ACT OF 1974, AS AMENDED, AND THE ATOMIC ENERGY ACT OF 1954, AS AMENDED:

   42 U.S.C. 5841 et seq.

   The Nuclear Regulatory Commission (NRC) was established by the Energy Reorganization Act of 1974, as amended, (42 U.S.C. 5801 et seq.). This Act abolished the Atomic Energy Commission and by section 201 (42 U.S.C. 5841), transferred to the NRC all the licensing and related regulatory functions of the Atomic Energy Commission. These functions included those of the Atomic Safety and Licensing Board Panel; the Advisory Committee on Reactor Safeguards; responsibilities for licensing and regulating nuclear facilities and materials; and conducting research for the purpose of confirmatory assessment related to licensing and other regulation, and other activities, including research related to nuclear material safety and regulation under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.).

2. EMPLOYMENT OF ALIENS:

   42 U.S.C. 2201(d)

   42 U.S.C. 2201(d) of the Atomic Energy Act of 1954, as amended, authorizes the Commission to employ persons and fix their compensation without regard to civil service laws.

3. SERVICES AUTHORIZED BY 5 U.S.C. 3109:

   5 U.S.C. 3109 provides in part that the head of an agency may procure by contract the temporary or intermittent services of experts or consultants when authorized by an appropriation.

4. PUBLICATION AND DISSEMINATION OF ATOMIC INFORMATION:

42 U.S.C. 2161(b)

42 U.S.C. 2161(b) directs that the Commission shall be guided by the principle that the dissemination of scientific and technical information related to atomic energy should be permitted and encouraged so as to provide that interchange of ideas and criticism which is essential to scientific and industrial progress and public understanding and to enlarge the fund of technical information.

5. PURCHASE, REPAIR, AND CLEANING OF UNIFORMS:

5 U.S.C. 5901

5 U.S.C. 5901 authorizes the annual appropriation of funds to each agency of the Government as a uniform allowance.

6. OFFICIAL REPRESENTATION EXPENSES:

47 Comp. Gen. 657

43 Comp. Gen. 305

This language is required because of the established rule restricting an agency from charging appropriations with the cost of official representation unless the appropriations involved are specifically available therefor. Congress has appropriated funds for official representation expenses to the NRC and NRC's predecessor, the Atomic Energy Commission, each year since FY 1950.

7. REIMBURSEMENTS TO THE GENERAL SERVICES ADMINISTRATION FOR SECURITY GUARD SERVICES:

34 Comp. Gen. 42

This language is required because, under the provisions of the Federal Property and Administrative Services Act of 1949, specific appropriation is made to the General Services Administration for carrying out the function of protecting public buildings and property and, therefore, NRC appropriations not specifically made available therefor may not be used to reimburse the General Services Administration for security guard services.

8. HIRE OF PASSENGER MOTOR VEHICLES AND AIRCRAFT:

31 U.S.C. 1343

31 U.S.C. 1343 provides in effect that unless specifically authorized by the appropriation concerned or other law, no appropriation shall be expended to purchase or hire passenger motor vehicles for any branch of the Government.

9. TO REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 1301

31 U.S.C. 1301 provides that no regular, annual appropriation shall be construed to be permanent or available continuously unless the appropriation expressly provides that it is available after the fiscal year covered by the law in which it appears.

10. SHALL BE DERIVED FROM THE NUCLEAR WASTE FUND:

41 U.S.C. 10131(b)(4)

42 U.S.C. 10222(a)(4)

41 U.S.C. 10131(b)(4) provides for the establishment of a Nuclear Waste Fund to ensure that the costs of carrying out activities relating to the disposal of high-level radioactive waste and spent nuclear fuel will be borne by the persons responsible for generating such waste and spent fuel.

42 U.S.C. 10222(a)(4) provides that the amounts paid by generators and owners of these materials into the fund is reviewed annually to determine if any fee adjustment is needed to insure full cost recovery.

42 U.S.C. 10134

42 U.S.C. 10133

42 U.S.C. 10134 specifically requires the NRC to license a repository for the disposal of high-level radioactive waste and spent nuclear fuel and sets forth certain licensing procedures. 42 U.S.C. 10133 also assigns review responsibilities to the NRC in the steps leading to submission of the license application. Thus, the Nuclear Waste Policy Act of 1982, as amended, establishes NRC's responsibility throughout the repository siting process,

culminating in the requirement for NRC licensing as a prerequisite to construction and operation of the repository.

42 U.S.C. 10222(d)

42 U.S.C. 10222(d) specifies that expenditures from the Nuclear Waste Fund can be used for purposes of radioactive waste disposal activities, including identification, development, licensing, construction, operation, decommissioning, and post-decommissioning maintenance and monitoring of any repository constructed under the Nuclear Waste Policy Act of 1982, and administrative cost of the radioactive waste disposal program.

11. FROM THIS APPROPRIATION, TRANSFERS OF SUMS MAY BE MADE TO OTHER AGENCIES OF THE GOVERNMENT FOR THE PERFORMANCE OF THE WORK FOR WHICH THIS APPROPRIATION IS MADE, AND IN SUCH CASES THE SUMS SO TRANSFERRED MAY BE MERGED WITH THE APPROPRIATION TO WHICH TRANSFERRED:

31 U.S.C. 1532

31 U.S.C. 1532 permits the transfer of appropriated funds from one account to another or to a working fund only when authorized by law.

12. MONEYS RECEIVED BY THE COMMISSION FOR THE COOPERATIVE NUCLEAR SAFETY RESEARCH PROGRAM, SERVICES RENDERED TO FOREIGN GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS, AND THE MATERIAL AND INFORMATION ACCESS AUTHORIZATION PROGRAMS, INCLUDING CRIMINAL HISTORY CHECKS UNDER SECTION 149 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, MAY BE RETAINED AND USED FOR SALARIES AND EXPENSES ASSOCIATED WITH THOSE ACTIVITIES, NOTWITHSTANDING 31 U.S.C. 3302, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 3302

The NRC is required to deposit all revenues collected to miscellaneous receipts of the Treasury unless specifically authorized by an appropriation to retain and use such revenue.

2 Comp. Gen. 775

Appropriated funds may not be augmented with funds from other sources unless specifically authorized by law. Under the cooperative nuclear safety research program, funds are received

from domestic entities, foreign governments, and international organizations for their participation in NRC's reactor safety research experiments. The NRC would be authorized to receive directly, compensation from foreign governments and international organizations for providing safety assistance and other services related to promoting the public health and safety. Funds are also received in the form of fees from licensees for the cost of security investigations and related processing associated with access to formula quantities of special nuclear material. These funds will be used to pay the related NRC processing costs and the agency performing the security investigations. Pursuant to P.L. 99-399, section 606, funds will be received in the form of fees from licensees for the cost of fingerprint examinations and criminal history checks of each individual granted access to safeguards information or unescorted access to a nuclear power plant. These funds will be used to pay for processing and performing the fingerprint examinations and criminal history checks. NRC will also use the money currently collected under 10 CFR Part 25 to pay the NRC processing costs and the Office of Personnel Management for conducting background investigations used as a basis for NRC security clearances for designated licensee representatives and other personnel requiring access to classified information.

13. REVENUES FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS SHALL BE RETAINED AND USED FOR NECESSARY SALARIES AND EXPENSES IN THIS ACCOUNT, NOTWITHSTANDING 31 U.S.C. 3302, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 9701

The NRC is authorized under Title V of the Independent Offices Appropriation Act of 1952 to collect license fees. Pursuant to 31 U.S.C. 9701, any person who receives a service or thing of value from the Commission shall pay fees to cover the NRC's cost in providing such service or thing of value.

42 U.S.C. 2213

42 U.S.C. 2214

Pursuant to 42 U.S.C. 2213, the NRC shall assess and collect annual charges from persons licensed by the Commission. 42 U.S.C. 2214 (P.L. 101-508, Title VI, Subtitle B, of the Omnibus Budget Reconciliation Act of 1990; and P.L. 102-486, Title XXIX, section 2903 of the Energy Policy Act of 1992) requires, except for the holder of any license for a federally-owned research reactor used primarily for educational training and academic research purposes, the Commission to assess and collect annual charges from persons licensed

by the Commission that approximate 100 percent of the Commission's budget authority, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), for each year of FY 1991-1998.

31 U.S.C. 3302

The NRC is required to deposit all revenues collected to miscellaneous receipts of the Treasury unless specifically authorized by an appropriation to retain and use such revenue.

14. THAT THE FUNDS HEREIN APPROPRIATED FOR REGULATORY REVIEWS AND OTHER ACTIVITIES PERTAINING TO WASTE STORED AT THE HANFORD SITE SHALL BE EXCLUDED FROM LICENSE FEE REVENUES, NOTWITHSTANDING 42 U.S.C. 2214.

The Department of Energy (DOE) is considering a two-phased program of remediation for high-level waste currently contained in tanks located on the Hanford Reservation in Richland, Washington. Phase 1 would involve a pilot-scale feasibility demonstration by private contractors under the regulatory control of DOE; Phase 2 would involve full-scale operation by private contractors, possibly licensed by the NRC. DOE has requested that the NRC undertake consultation and safety review activities for DOE during Phase 1. Under the Independent Offices Appropriation Act of 1952, 31 U.S.C. 9701, the NRC is not authorized to charge fees to DOE for these activities. Rather than have the NRC recover these costs under its 100 percent cost recovery requirement by assessing fees to its licensees, the costs of these consultation and review activities would be derived from appropriated funds.

15. THE SUM HEREIN APPROPRIATED SHALL BE REDUCED BY THE AMOUNT OF REVENUES RECEIVED FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS, EXCLUDING THOSE MONEYS RECEIVED FOR THE COOPERATIVE NUCLEAR SAFETY RESEARCH PROGRAM, SERVICES RENDERED TO FOREIGN GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS, AND THE MATERIAL AND INFORMATION ACCESS AUTHORIZATION PROGRAMS:

42 U.S.C. 2214

The total fees to be collected in FY 1997 are to approximate 100 percent of the Commission's budget authority. Pursuant to 42 U.S.C 2214 (P.L. 101-508, Title VI, Subtitle B, section 6101 (a)(2)(3) and (c)(2)), the aggregate amount of the annual charge collected from all licensees shall equal an amount that approximates 100 percent of the budget authority of

the Commission in the fiscal year in which such charge is collected, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), for each year of FY 1991-1998.

Office of Inspector General

16. FOR NECESSARY EXPENSES OF THE OFFICE OF INSPECTOR GENERAL IN CARRYING OUT THE PROVISIONS OF THE INSPECTOR GENERAL ACT OF 1978, AS AMENDED:

P.L. 95-452

P.L. 100-504

P.L. 100-504 amended P.L. 95-452 to establish the Office of Inspector General within the NRC effective April 17, 1989, and to require the establishment of a separate appropriation account to fund the Office of Inspector General.

17. SERVICES AUTHORIZED BY 5 U.S.C. 3109:

5 U.S.C. 3109 provides in part that the head of an agency may procure by contract the temporary or intermittent services of experts or consultants when authorized by an appropriation.

18. TO REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 1301

31 U.S.C. 1301 provides that no regular, annual appropriation shall be construed to be permanent or available continuously unless the appropriation expressly provides that it is available after the fiscal year covered by the law in which it appears.

19. AN AMOUNT NOT TO EXCEED 5 PERCENT OF THIS SUM MAY BE TRANSFERRED FROM SALARIES AND EXPENSES, NUCLEAR REGULATORY COMMISSION: PROVIDED, THAT NOTICE OF SUCH TRANSFERS SHALL BE GIVEN TO THE COMMITTEES ON APPROPRIATIONS OF THE HOUSE AND SENATE:

31 U.S.C. 1301

31 U.S.C. 1301 prohibits the transfer of funds between appropriations without specific statutory authority. This language provides for limited transfer authority from NRC's Salaries and Expenses appropriation to its Office of Inspector General appropriation. This will permit the NRC to augment the Office of Inspector General appropriation on a limited basis, if it becomes necessary, without seeking additional appropriations for that fiscal year.

20. FROM THIS APPROPRIATION, TRANSFERS OF SUMS MAY BE MADE TO OTHER AGENCIES OF THE GOVERNMENT FOR THE PERFORMANCE OF THE WORK FOR WHICH THIS APPROPRIATION IS MADE, AND IN SUCH CASES THE SUMS SO TRANSFERRED MAY BE MERGED WITH THE APPROPRIATION TO WHICH TRANSFERRED:

31 U.S.C. 1532

31 U.S.C. 1532 permits the transfer of appropriated funds from one account to another or to a working fund only when authorized by law.

21. REVENUES FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS SHALL BE RETAINED AND USED FOR NECESSARY SALARIES AND EXPENSES IN THIS ACCOUNT, NOTWITHSTANDING 31 U.S.C. 3302, AND SHALL REMAIN AVAILABLE UNTIL EXPENDED:

31 U.S.C. 9701

The NRC is authorized under Title V of the Independent Offices Appropriation Act of 1952 to collect license fees. Pursuant to 31 U.S.C. 9701, any person who receives a service or thing of value from the Commission shall pay fees to cover the NRC's cost in providing such service or thing of value.

42 U.S.C. 2213

42 U.S.C. 2214

Pursuant to 42 U.S.C. 2213, the NRC shall assess and collect annual charges from persons licensed by the Commission. 42 U.S.C. 2214 (P.L. 101-508, Title VI, Subtitle B, of the Omnibus Budget Reconciliation Act of 1990; and P.L. 102-486, Title XXIX, section 2903 of the Energy Policy Act of 1992) requires, except for the holder of any license for a federally-owned research reactor used primarily for educational training and academic research purposes, the Commission to assess and collect annual charges from persons licensed by the Commission that approximate 100 percent of the Commission's budget authority, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), for each year of FY 1991-1998.

31 U.S.C. 3302

The NRC is required to deposit all revenues collected to miscellaneous receipts of the Treasury unless specifically authorized by an appropriation to retain and use such revenue.

22. THE SUM HEREIN APPROPRIATED SHALL BE REDUCED BY THE AMOUNT OF REVENUES RECEIVED FROM LICENSING FEES, INSPECTION SERVICES, AND OTHER SERVICES AND COLLECTIONS:

42 U.S.C. 2214

The total fees to be collected in FY 1997 are to approximate 100 percent of the Commission's budget authority. Pursuant to 42 U.S.C. 2214 (P.L. 101-508, Title VI, Subtitle B, section 6101 (a)(2)(3) and (c)(2)), the aggregate amount of the annual charge collected from all licensees shall equal an amount that approximates 100 percent of the budget authority of the Commission in the fiscal year in which such charge is collected, less any amount appropriated to the Commission from the Nuclear Waste Fund and the amount of fees collected under the Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701), for each year of FY 1991-1998.

SUMMARY

SUMMARY OF BUDGET AUTHORITY BY FUNCTION

	FY 1995 Enacted[1]	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
NRC Appropriation: Salaries and Expenses (S&E) ($K)				
Salaries and Benefits	252,635	258,939	267,097	8,158
Contract Support	250,367	194,932	194,256	-676
Travel	15,789	14,429	13,947	-482
Total (S&E)	518,791	468,300	475,300	7,000
NRC Appropriation: Office of Inspector General (IG) ($K)				
Salaries and Benefits	4,192	4,400	4,400	0
Contract Support	653	360	360	0
Travel	235	240	240	0
Total (IG)	5,080	5,000	5,000	0
Total NRC Budget Authority by Function ($K)				
Salaries and Benefits	256,827	263,339	271,497	8,158
Contract Support	251,020	195,292	194,616	-676
Travel	16,024	14,669	14,187	-482
Total NRC	523,871	473,300	480,300	7,000

[1]FY 1995 Salaries and Expenses appropriations account: $1.71 million rescinded pursuant to P. L. 104-19, Emergency Supplemental, Disaster Assistance, and Rescissions Act, 1995.

SUMMARY

SUMMARY OF BUDGET AUTHORITY BY PROGRAM AND BY COST CENTER

	FY 1995 Enacted[1]	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Reactor Program by Cost Center ($K)				
Reactor Regulation	231,480	213,302	220,458	7,156
Standard Reactor Designs	37,092	19,926	14,422	-5,504
Test and Research Reactors	1,670	2,149	2,190	41
Subtotal	270,242	235,377	237,070	1,693
Nuclear Materials and Nuclear Waste Program by Cost Center ($K)				
Fuel Facilities	11,094	11,137	15,045	3,908
Materials Users	27,480	29,330	30,565	1,235
Low-Level Waste and Decommissioning	19,832	16,770	16,425	-345
Other Nuclear Materials and Waste Activities	7,366	6,967	7,275	308
High-Level Waste	22,000	11,000	14,000	3,000
Subtotal	87,772	75,204	83,310	8,106
Management and Support Program by Cost Center ($K)				
Policy and Direction	17,048	17,239	17,855	616
Resource and Administration	130,915	128,291	125,949	-2,342
Special Technical Programs	12,814	12,189	11,116	-1,073
Subtotal	160,777	157,719	154,920	-2,799
Inspector General Program ($K)	5,080	5,000	5,000	0
Total NRC	523,871	473,300	480,300	7,000

[1]FY 1995 Salaries and Expenses appropriations account: $1.71 million rescinded pursuant to P.L. 104-19, Emergency Supplemental, Disaster Assistance, and Rescissions Act, 1995.

SUMMARY

SUMMARY OF STAFFING BY PROGRAM AND BY COST CENTER

	FY 1995 FTE	FY 1996 FTE	FY 1997 Estimate	
			FTE Request	Change from FY 1996
Reactor Program by Cost Center				
Reactor Regulation	1,610	1,603	1,608	5
Standard Reactor Designs	169	121	86	-35
Test and Research Reactors	15	20	20	0
Subtotal	1,794	1,744	1,714	-30
Nuclear Materials and Nuclear Waste Program by Cost Center				
Fuel Facilities	107	108	121	13
Materials Users	237	258	249	-9
Low-Level Waste and Decommissioning	121	115	116	1
Other Nuclear Materials and Waste Activities	69	67	68	1
High-Level Waste	59	43	43	0
Subtotal	593	591	597	6
Management and Support Program by Cost Center				
Policy and Direction	179	177	177	0
Resource and Administration	513	512	503	-9
Special Technical Programs	95	92	86	-6
Subtotal	787	781	766	-15
Inspector General Program	44	44	43	-1
Total NRC	3,218	3,160	3,120	-40

SUMMARY

EXPLANATION OF RESOURCE CHANGES

REACTOR PROGRAM

FY 1997 Change From FY 1996 ..... $1,693,000

The resource increase is due primarily to increased costs for salaries and benefits. Additionally, FY 1997 resources increase as work efforts begin to consolidate thermal hydraulic analysis codes; to characterize the performance of high burnup fuels; to develop regulations governing the use of digital reactor control systems and for verifying and validating control system software being proposed for use; and to accelerate the implementation of a risk-informed regulatory decision-making and rulemaking process. These increases are partially offset by decreases that reflect completion of standard reactor design reviews.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM

FY 1997 Change From FY 1996 ..... $8,106,000

The resource increase in FY 1997 reflects primarily (1) NRC's interaction with the Department of Energy (DOE) on their proposed High-Level Radioactive Waste Solidification System at Hanford, Washington; (2) preparation for the review of an application for a privately-owned independent spent fuel installation, and an expected increase in the number of industry applications for dual purpose (transportation and interim storage) spent fuel casks; and (3) NRC's efforts in the area of high-level waste to keep pace with the revised DOE program, address key technical issues, and maintain the Center for Nuclear Regulatory Analysis.

MANAGEMENT AND SUPPORT PROGRAM

FY 1997 Change From FY 1996 .....-$2,799,000

The resource decreases in FY 1997 result from delaying information technology purchases, changing our obligation process for employee moves, and decreasing administrative support and travel consistent with overall agency downsizing. Resources also decrease due to the discontinuation of support for Agreement States travel in conjunction with NRC training courses and reviews of requested DOD/DOE reactor projects and facilities. These decreases are partially offset by increased costs to implement Department of Justice recommendations for improving Federal building security and for salaries and benefits.

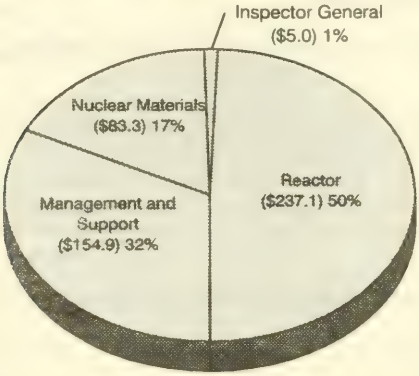
SUMMARY

INSPECTOR GENERAL PROGRAM

FY 1997 Change From FY 1996 ..... $0

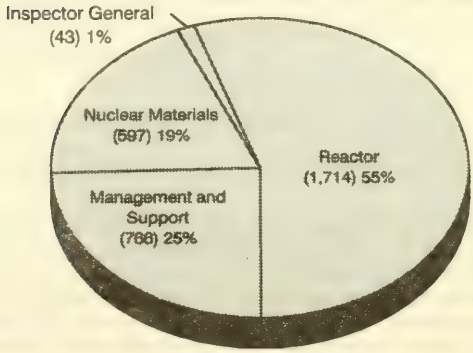
Resources for this program remain essentially level. There are no significant program changes.

DISTRIBUTION OF NRC BUDGET AUTHORITY BY PROGRAM



FY 1997 ($480.3 MILLION)

DISTRIBUTION OF NRC STAFF BY PROGRAM



FY 1997 (TOTAL STAFF 3,120 FTE)

Note: Percentages are rounded to the nearest whole number

REACTOR PROGRAM

REACTOR PROGRAM

(Dollar amounts in tables represent thousands of dollars ($K). In text, whole dollar amounts are used. Staff numbers represent full-time equivalents (FTEs).)

Total FY 1997 Estimate $237,070,000

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	147,140	149,900	153,678	3,778
Contract Support	112,328	75,376	73,402	-1,974
Travel	10,774	10,101	9,990	-111
Total	270,242	235,377	237,070	1,693
Budget Authority by Cost Center ($K)				
Reactor Regulation	231,480	213,302	220,458	7,156
Standard Reactor Designs	37,092	19,926	14,422	-5,504
Test and Research Reactors	1,670	2,149	2,190	41
Total	270,242	235,377	237,070	1,693
Full-Time Equivalent Employment (FTE) by Cost Center				
Reactor Regulation	1,610	1,603	1,608	5
Standard Reactor Designs	169	121	86	-35
Test and Research Reactors	15	20	20	0
Total	1,794	1,744	1,714	-30

EXPLANATION OF RESOURCE CHANGES

Reactor Regulation

The resource increase in FY 1997 is due primarily to increased costs for salaries and benefits. Additionally, FY 1997 resources increase as work efforts begin to consolidate thermal hydraulic analysis codes to simplify their use and to reduce the long-term costs of code maintenance; to characterize the performance of high burnup fuels during severe transients and accidents to revise

related codes used by NRC and industry; to develop regulations governing the use of digital reactor control systems and for verifying and validating control system software being proposed for use; and to accelerate the implementation of a risk-informed regulatory decision-making and rulemaking process.

Standard Reactor Designs

The resource decrease in FY 1997 reflects completion of work related to standard reactor design reviews, completion of updates to the standard review plan, and supporting research related to the passive designs.

Test and Research Reactors

There are no significant resource or program changes.

DESCRIPTION OF PROGRAM

The Reactor Program encompasses all NRC inspection, oversight, and licensing of reactor facilities, as required by the Atomic Energy Act of 1954, as amended; all reactor regulatory research as required by the Energy Reorganization Act of 1974 (Section 205 of Public Law 95-209); and all other functions associated with reactors including evaluations of safety concerns, assessment of operational events and experience, technical training for NRC staff, independent reviews and legal advice to the Commission on safety issues, adjudicatory reviews, investigations of wrongdoing by reactor licensees, and reactor enforcement policies and actions to protect the public health and safety. This program also provides assistance to the Department of Energy in assessing and resolving technical and licensing issues to support potential tritium production in commercial light water reactors.

The Reactor Program is conducted by several NRC organizations, encompassing efforts at headquarters and in the regions. The NRC's Office of Nuclear Reactor Regulation (NRR) is responsible for evaluating the public health, safety, environmental, safeguards, and antitrust aspects of reactor facilities, and ensuring that civilian reactor facilities are designed, constructed, and operated safely and are in compliance with agency regulations. Through these efforts, the NRC ensures that nuclear reactors are designed and constructed properly and are ready for safe operation; that licensees operate nuclear plants safely and are adequately prepared to respond in the event of an accident; and that licensees possess the capability to protect against sabotage and theft of nuclear materials at reactors. NRR, in coordination with the Office of Nuclear Regulatory Research (RES), ensures that the NRC is prepared for the future licensing of reactors by reviewing applications for standard reactor design certification and reactor license renewal.

REACTOR PROGRAM

The Office of Nuclear Regulatory Research is responsible for developing recommendations for research and engaging in or contracting for research deemed necessary by the Commission in performing reactor licensing and related regulatory functions. RES provides independent expertise and information for making timely regulatory judgments, anticipates problems of potential safety significance for which new or expanded knowledge can assist the NRC in pursuing its mission, and develops regulations and regulatory guidance necessary to implement Commission policy or technical requirements. In conducting the agency's reactor safety research program, RES uses relatively new and highly complex technologies to make regulatory judgments on matters related to safety that are well beyond normal experience-based engineering practice. The NRC finds it essential to develop a body of knowledge that gives confidence in judgments to avoid undue risk to the health and safety of the public, especially when these matters involve high-consequence accidents. The NRC uses this body of knowledge in establishing the technical bases for issuing timely safety regulations and completing licensing and inspection activities based on the NRC's longstanding philosophy of defense in depth.

In an effort to make use of all available sources of safety research information, the NRC is engaged in broad cooperative international safety research programs to exchange nuclear safety-related information and to conduct joint research projects of mutual interest. The NRC's policy of cooperating with foreign groups is designed to (1) obtain foreign experimental and analytical research results to expand NRC's technical base, (2) encourage foreign safety research programs to make the optimum use of NRC resources and enhance our research capabilities, and (3) interact with foreign nuclear safety organizations to obtain expert review of our research results. In addition, cooperative research between the NRC and industry is pursued in areas where conflict of interest issues are not involved.

Other NRC organizations also support the Reactor Program. The Office for Analysis and Evaluation of Operational Data (AEOD) provides the NRC with an independent capability to analyze operational data and coordinates the development and implementation of the NRC staff technical qualification program. The Office of Investigations (OI) investigates alleged wrongdoing by licensees, applicants, contractors, or vendors. The Office of Enforcement (OE) takes appropriate enforcement action against licensees for violations of NRC regulations. The Office of Nuclear Material Safety and Safeguards (NMSS) evaluates the threat environment at domestic reactors. The Office of the General Counsel (OGC) provides legal advice on all matters pertaining to reactors. The Advisory Committee on Reactor Safeguards (ACRS) provides independent advice to the Commission on safety aspects of proposed and existing nuclear plants. The Atomic Safety and Licensing Board Panel (ASLBP) conducts hearings and makes decisions in proceedings to grant, amend, suspend, or revoke NRC licenses.

The Reactor Program comprises the following three cost centers: Reactor Regulation; Standard Reactor Designs; and Test and Research Reactors.

REACTOR PROGRAM

The funds and staffing for each of the cost centers are discussed on pages 26 through 77. The contract support funds are allocated for work done by Department of Energy (DOE) contractors, commercial contractors, small business entities, nonprofit organizations (e.g., universities and foundations), and grantees. The narrative that follows describes these cost centers and addresses the reasons why the resources are needed.

Reactor Regulation Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	131,483	137,377	143,903	6,526
Contract Support	89,743	66,273	67,049	776
Travel	10,254	9,652	9,506	-146
Total	231,480	213,302	220,458	7,156
Budget Authority by Activity ($K)				
Reactor Inspection	51,334	52,105	53,883	1,778
Reactor Oversight	56,515	55,885	57,725	1,840
Reactor and Site Licensing	4,641	1,238	770	-468
Reactor Aging and Renewal	26,618	22,084	22,455	371
Reactor Safety Assessment and Regulation Development	44,727	37,176	39,662	2,486
Independent Analysis of Operational Experience	14,829	12,243	12,256	13
Technical Training and Qualification	6,881	6,163	6,368	205
Investigations, Enforcement, and Legal Advice	5,555	5,816	5,975	159
Independent Review	4,543	4,551	4,656	105
General Support	15,837	16,041	16,708	667
Total	231,480	213,302	220,458	7,156

REACTOR PROGRAM: Reactor Regulation

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Full-Time Equivalent Employment (FTE) by Activity				
Reactor Inspection	562	570	560	-10
Reactor Oversight	495	521	530	9
Reactor and Site Licensing	31	7	4	-3
Reactor Aging and Renewal	74	69	72	3
Reactor Safety Assessment and Regulation Development	87	92	100	8
Independent Analysis of Operational Experience	68	65	65	0
Technical Training and Qualification	25	26	27	1
Investigations, Enforcement, and Legal Advice	58	58	58	0
Independent Review	42	41	41	0
General Support	168	154	151	-3
Total	1,610	1,603	1,608	5

This cost center comprises work to ensure that nuclear power plants are designed, constructed, and operated safely; prepare for future licensing activities to renew existing reactor licenses and reactivate existing reactors that have been deferred; establish a sound technical basis and regulatory framework for reactor licensing activities; ensure that the safety-related reactor plant systems and components perform their required function and maintain their integrity and operability over the life of the plant; provide technical requirements and the regulatory framework for renewal of nuclear power plant operating licenses upon expiration of their 40-year license term; evaluate safety concerns involving reactor facilities; assess reactor operational events and experience; conduct reactor technical training for NRC staff; provide technical advice to the Commission on reactor safety issues; conduct reactor adjudicatory reviews; investigate alleged wrongdoing by NRC reactor licensees; and pursue reactor enforcement policy and actions to protect the public health and safety.

This cost center comprises ten major activities: reactor inspection; reactor oversight; reactor and site licensing; reactor aging and renewal; reactor safety assessment and regulation development; independent analysis of operational experience; technical training and qualification; investigations, enforcement, and legal advice; independent review; and general support.

Reactor Inspection

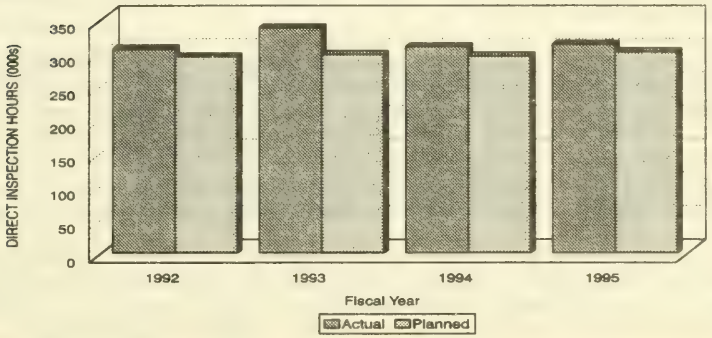
Three essential components of NRC's reactor inspection program are to determine the state of reactor safety, to confirm that operations are in compliance with the provisions of the license, and to ascertain whether other conditions exist with safety implications serious enough to warrant corrective action. The primary focus is on plant operations, maintenance, engineering, plant support, and licensee control systems; and includes efforts by NRC resident, region-based, and headquarters inspectors.

The NRC's inspection program consists of three basic types of inspections (1) the core inspection program, (2) plant-specific regional initiative inspections, and (3) generic safety issue inspections. In FY 1997, the NRC will continue to work toward refining probabilistic risk assessment (PRA) methods and information and incorporating them into inspection planning and assessment of potential safety issues. This effort is part of the agency-wide PRA implementation plan for strengthening and increasing the use of PRA technology in agency regulatory activities. For those plants that have demonstrated superior performance in specific areas of the NRC's systematic assessment of licensee performance (SALP) program, the goal is that they receive only the core inspection program and generic safety issue inspections. Regional administrators have significant flexibility to direct additional inspections on safety problems and on plants that require special attention rather than on completing a more rigidly defined inspection program for each site. This flexibility helps to ensure that resources are allocated effectively to enhance reactor safety.

The NRC conducts inspections at all operating reactors each year. Historically, NRC resident and region-based staff have spent a yearly average of approximately 2,800 hours in direct onsite inspection activities at each reactor. This overall average is expected to continue in FY 1997; however, efforts are being made to better allocate resources based on licensee performance.

The following chart compares the actual and planned direct inspection effort. Direct inspection effort in FY 1995 was approximately 312,000 hours for all plants, which is approximately five percent more than the hours planned. This equates to an average of approximately 2,835 hours in direct onsite inspection per reactor.

Figure 1
DIRECT INSPECTION ACTIVITY
Actual vs. Planned



The NRC assigns at least two resident inspectors to each operating reactor site. Their primary job is to observe, evaluate, and report on the adequacy of licensee nuclear safety activities concentrating on day-to-day licensee operations, event follow-up activities, and licensee activities and processes important to safety and reliability. In addition, they coordinate onsite activities of the various agency offices and participate in emergency exercises. Resident inspectors carry out the major part of the core inspection program and participate in regional initiative and generic safety issue inspections.

Region-based and headquarters inspectors supplement the activities carried out by resident inspectors through a variety of program and technical inspections that afford an indepth look at licensee operations. Indepth, specialized technical inspections are carried out by inspectors in the broad areas of plant operations, maintenance, engineering, plant support (security, radiation safety, emergency preparedness), and licensee control systems (systems established by the licensee to identify, resolve, and prevent problems that would degrade plant safety). In addition, region-based inspectors and headquarters staff respond to allegations of safety and safeguards violations at nuclear facilities and provide technical support to investigative personnel.

The NRC also conducts operationally-determined inspections, which are comprehensive examinations that evaluate the performance of plant systems under specific circumstances. Such inspections include, but are not limited to, service water system operational performance inspections, operational readiness assessment team inspections, safety system functional inspections, safety systems outage modification inspections, operational safety team inspections, and safety issue inspections. These inspections are conducted by teams of specialists that include operations-, design-, and installation-oriented personnel, and provide senior NRC management with integrated perspectives on plant performance in specific areas of operational safety where regional inspections indicate the need for more comprehensive inspection. The NRC plans to conduct approximately 6 operationally-determined inspections in FY 1997.

Vendor/contractor inspections are reactive in nature and determine whether suppliers of materials, components, and services used in nuclear power plants are complying with NRC requirements. These inspections improve reactor safety by (1) ensuring that root causes of reported vendor-related problems are identified and that suitable corrective actions are developed and implemented, (2) informing the nuclear industry of substandard, suspected counterfeit, or fraudulently marketed vendor products, and (3) ensuring that fraudulently marketed products are traced to their source. The NRC plans to conduct approximately 35 reactor vendor/contractor inspections in FY 1997.

Reactor operator licensing requalification inspections were implemented as part of the FY 1994 amendment to NRC's operator licensing regulations. The NRC will use this performance-based inspection program to evaluate licensee examination and training programs and to improve operational safety through early identification and correction of programmatic weaknesses.

The NRC is implementing an Integrated Performance Assessment Process (IPAP) to improve the periodic, long-term integration of licensee performance information to arrive at conclusions regarding licensee performance and provide site-specific recommendations for future inspections. IPAP supplements existing processes that provide ongoing integration as well as direct feedback on the effectiveness of the inspection program. In the review phase, the staff will integrate performance information from inspection reports, enforcement actions, systematic assessment of licensee performance (SALP), senior management meetings, plant performance reviews, licensee event reports, and individual plant evaluations to arrive at an independent view of a plant's strengths and weaknesses. In the site inspection phase, the staff validates the results of the review. In the final phase, members of the review team develop a final licensee evaluation and make recommendations for changes to priorities and emphases in the inspection program. The NRC plans to conduct IPAP assessments at approximately 18 operating reactor sites in FY 1997.

REACTOR PROGRAM: Reactor Regulation

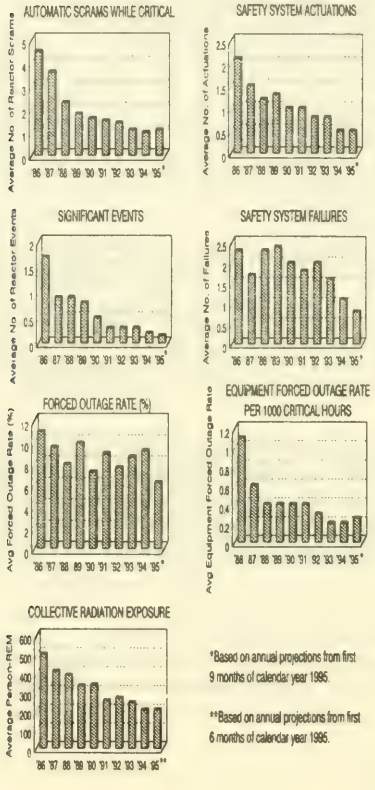
Reactor Oversight

The NRC ensures that operating facilities maintain adequate levels of protection of public health and safety in their daily operation and throughout the life cycle of the plant. The NRC oversees safety in all operating conditions, in the event of a radiological emergency or theft of nuclear materials or sabotage. This safety oversight includes assurances that facilities are adequately designed and maintained, and that trained and qualified operating and technical support personnel can prevent or cope with accidents and other threats to public health and safety. The NRC fulfills its oversight role by performing probabilistic risk assessments to identify inadequacies in plant design and operation; evaluating operating experience and unanticipated events; resolving safety issues, inspection findings, and licensee proposals; and sponsoring safety research. These efforts enable the NRC to evaluate both plant and human performance, including accident management capability, and to focus on operational safety. Senior agency managers have the discretion to apply additional attention to plants for which systematic assessment of licensee performance (SALP) scores, significant events, or inspection findings indicate deficiencies.

Safety of operations is the responsibility of NRC licensees. Regulatory oversight of licensee safety is the responsibility of NRC. The safety performance of licensees is partially a reflection of the NRC's performance; however, it is not possible to isolate the causal relationship or a specific set of factors that directly link the NRC's performance to licensee performance. Safety performance indicators reflect the collective results of the efforts of the NRC and the nuclear industry. Certain trends in industry performance indicate that the NRC is succeeding in its mission of protecting the public health and safety.

There are seven NRC-approved indicators of industry safety performance as depicted in the following charts, Licensee Performance Indicators for Operating Nuclear Power Plants; Annual Industry Averages for 1986-1995. Over the past ten years, the general trend of the set of industry safety performance indicators has shown improved performance. The overall trend appears to have leveled off in recent years even though several of the indicators continue to show improvement.

Figure 2
LICENSEE PERFORMANCE INDICATORS
FOR OPERATING NUCLEAR POWER PLANTS
Annual Industry Averages, CY1986-1995


AUTOMATIC SCRAMS WHILE CRITICAL
Average No. of Reactor Scrams
SAFETY SYSTEM ACTUATIONS
Average No. of Actuations
SIGNIFICANT EVENTS
Average No. of Reactor Events
SAFETY SYSTEM FAILURES
Average No. of Failures
FORCED OUTAGE RATE (%)
Avg Forced Outage Rate (%)
EQUIPMENT FORCED OUTAGE RATE PER 1000 CRITICAL HOURS
Avg Equipment Forced Outage Rate
COLLECTIVE RADIATION EXPOSURE
Average Person-REM
'86 '87 '88 '89 '90 '91 '92 '93 '94 '95*
'86 '87 '88 '89 '90 '91 '92 '93 '94 '95**

*Based on annual projections from first 9 months of calendar year 1995.

**Based on annual projections from first 6 months of calendar year 1995.

REACTOR PROGRAM: Reactor Regulation

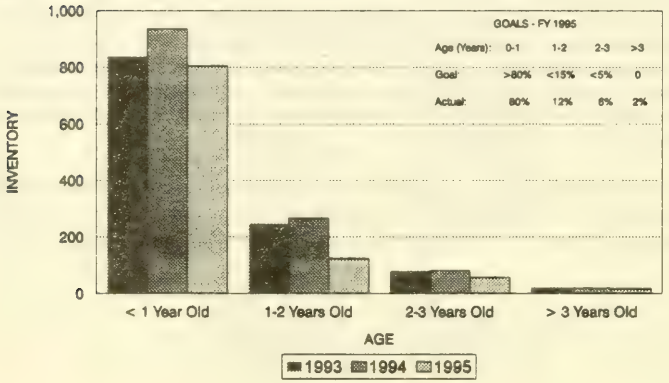
Project managers perform the overall management activities pertaining to the regulation of nuclear power plants and serve as the headquarters point of contact with licensees, other NRC staff, and the public on safety matters concerning specific plants. They assign priorities to safety issues and manage the review and issuance of license amendments. In addition to reviewing plant modification activities that are initiated by licensees, project managers also review safety and environmental modifications to operating plants that are directed by the NRC as a result of safety, environmental, and safeguards assessments. Through the review of these modifications, the NRC ensures that operating facilities achieve and maintain adequate protection of the public health and safety. Project managers also consult with State and local officials and reply to public and congressional inquiries. In addition, they conduct selected technical reviews, coordinate complex technical reviews, evaluate overall licensee performance, and assist the regions in developing inspection plans. The NRC will continue to conduct project management activities for all operating reactors in FY 1997.

After an operating license is issued, the requirements of the license may need to be changed as a result of routine activities, technical advances, or unexpected events at power plants. Detailed technical review of these licensing actions is necessary to ensure that the operational safety of the plant is not compromised. Routine post-licensing activities affecting reactor operations include requests for license amendments, requests for exemption from regulations, new regulations requiring backfit modifications to operating reactors, and orders for modifications of a license. Licensing actions can affect more than one plant.

To manage these changes effectively, the NRC has made a distinction between items that require review and approval by the NRC before they are implemented by the licensee (licensing actions) and items that either require licensee certification or do not require prior NRC review and approval (other licensing tasks).

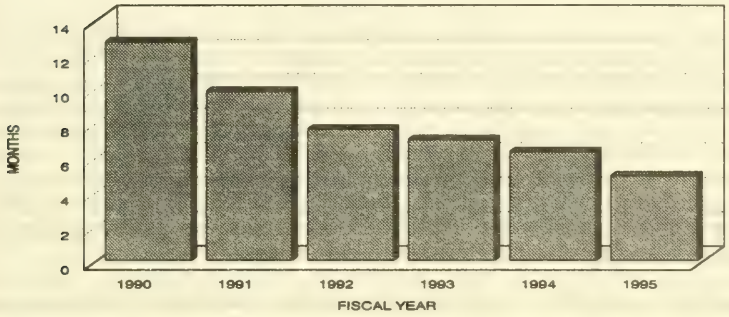
In FY 1995, the NRC completed approximately 2,061 licensing actions for operating power reactors. Over 99 percent of the actions in inventory are plant-specific actions requested by licensees and the rest are the result of NRC-imposed requirements. The total licensing action inventory has decreased from 1,293 licensing actions at the end of FY 1994 to 1,000 under review at the end of FY 1995. The NRC has established goals to control the size and age of the licensing action inventory. These goals call for 80 percent of these actions to be 1 year old or less, 95 percent to be 2 years old or less, and all actions to be no more than 3 years old. The following chart shows the age of licensing actions in the inventory at the end of FY 1995.

Figure 3
AGE OF LICENSING ACTIONS



Steady progress has been realized in reducing the number of older actions in the licensing action inventory. From FY 1989 through FY 1995, the percentage of licensing actions more than 3 years old dropped from 23 percent to 2 percent. Improvement has been made in the other categories as well. As the following chart shows, the median age of the licensing action inventory has also decreased over time.

Figure 4
LICENSING ACTIONS
Median Age of Inventory



The NRC expects to complete approximately 1,500 operating reactor licensing actions in FY 1997. These actions include conversions of plant-specific technical specifications to the improved standard technical specifications. As technical specifications (that are part of the operating license) increased in size over the years, some of the requirements became less safety-significant than others. Therefore, the NRC has worked with industry to improve technical specifications to make them more operator oriented and to focus on the more safety-significant requirements. Through FY 1997, the NRC will continue efforts to convert existing technical specifications for 56 units to the improved standard technical specifications. By the end of FY 1995, a total of 11 units were converted . In FY 1996, 11 additional units will be converted and 34 more units will be converted in FY 1997. Confirmation that the conversions were performed correctly will be completed in FY 1998.

Another major licensing action effort will result from applications from licensees to increase their power ratings by a small percentage (5 percent). Licensees of approximately 10 boiling water reactor (BWR) units have expressed interest in the BWR power uprate program; power uprates could increase the available electrical generating capacity in the United States by 1,000 megawatts with

minimal plant modification and minimal impact on plant safety margins. The NRC expects to process four to six power uprate applications in FY 1997.

The NRC will also continue to review licensing actions that have no adverse effect on safety but that would provide economic relief to licensees. These cost-beneficial licensing actions (CBLAs) can reduce the burden on licensees without adversely affecting safety at currently operating plants. To be responsive to requests for CBLAs, the NRC will assign a higher review priority to requests of relatively low safety significance when such changes result in a high economic benefit to licensees. Safety significant issues will continue to receive high priority.

In FY 1997, the NRC will begin assisting the Department of Energy (DOE) in its selection of the primary and backup approach to tritium production. One designated alternative is to produce tritium in commercial light-water reactors. The NRC will assist DOE in assessing and resolving technical and licensing issues (including physical security, security clearance, and environmental issues) to support a DOE Secretarial decision on the primary and backup tritium production approach. The production of tritium under an existing commercial license will require DOE and NRC to develop mechanisms to assure that national defense production requirements will not affect regulation, including plant shutdown for safety reasons, of the facilities. This would likely involve the use of multiple reactors for tritium production. The NRC will evaluate the necessary licensing requests to implement DOE's option of producing tritium in commercial reactors.

Issues that do not require NRC review and approval before they are implemented by the licensee are considered "other licensing tasks." These tasks may result in a safety evaluation, a letter to the licensee, or NRC internal documentation concerning technical or administrative issues for a particular plant. The NRC expects to complete approximately 750 "other licensing tasks" in FY 1997.

The NRC can streamline the licensing action process by reviewing and approving topical reports submitted by licensees, vendor/owner groups, and other parties. Topical reports deal with safety issues and cost beneficial changes common to a set of plants. The NRC will review the 15 to 25 most safety-significant and cost-beneficial topical reports in FY 1997.

Each year the Reactor Engineer Intern Program graduates a group of qualified, broadly trained technical and engineering personnel to assume professional positions in the NRC. Through a series of rotational and technical training assignments, the interns are given broad exposure to the work performed by the NRC. After successfully completing the 2-year program, interns are assigned permanently to technical professional positions. Through FY 1997, the program will continue to support both the headquarters and the regional missions of the Reactor Regulation Cost Center.

Experience has shown that safety issues will continue to arise as a result of events at operating reactors. In response to these events, the NRC analyzes various aspects of reactor performance to

identify actions that would help to prevent significant events, and disseminates the findings to licensees via generic communication. This work supports NRC's accident prevention goals of having an effective regulatory program that reduces the potential for safety-system challenges, and that ensures high availability of equipment, effective operating personnel, and timely sharing of operating experience.

The NRC conducts prompt technical screening and assessments of approximately 1,500 to 2,000 nuclear reactor event reports and other incoming data from sources such as daily plant status reports, international events information, and DOE reports each year to determine the immediate safety implications for a facility, the applicability to other operating nuclear reactors, and the regulatory actions that must be taken. Event reports include telephone notifications of significant events at licensed nuclear reactor facilities, as well as additional written event and follow-up reports. In addition to the normal follow-up activities provided by the resident inspectors and regional inspection staff to ensure that affected facilities take appropriate corrective action, some events are designated further followup evaluation.

Each year, the screening and assessment of incoming reactor events and other source data results in approximately 400 items that require follow-up effort by the NRC. This is in addition to other items requiring follow-up such as the approximately 50 potential generic safety questions and associated reports to the NRC headquarters staff for technical assessment, and the several hundred reports of defects and/or noncompliance (10 CFR Part 21, "Reporting of Defects and Noncompliance") submitted annually by licensees and permit holders. The purpose of this follow-up review is to establish the safety significance of the item, its applicability to other operating nuclear reactors, and the regulatory actions that must be taken.

On the basis of NRC's follow-up activities, the agency may determine that a potential safety concern exists, and recommend or require that corrective action be taken. In some cases, this may result in changes to the Commission's regulations. In other cases that warrant prompt operating experience feedback to licensees or vendors of the existence of a potential generic safety-related problem, the NRC will issue a generic communication (i.e., a generic letter, information notice, or bulletin) to inform recipients of the safety issue and may recommend corrective action. The NRC expects to prepare and issue approximately 100 generic communications related to operating nuclear power reactors each year. To assist the staff in analyzing data and making decisions on issues affecting safety, the NRC created an in-house organization to develop and apply advanced computer codes used to analyze plant data for operating nuclear reactor performance, safety analysis of new reactor designs, and other special studies. Through FY 1997, the NRC will maintain the analytical capability to support technical reviews.

The NRC will also continue to support the incident investigation program by providing resources to augment inspection teams and incident investigation teams in FY 1997 in response to significant operating events. This function is discussed further in Independent Analysis of Operating Experience.

The systematic assessment of licensee performance (SALP) program involves collecting and assessing inspection data on each site. The purposes of the SALP review process are (1) to conduct an integrated assessment of performance for safe plant operation, (2) to provide a means for useful dialogue with the licensee, (3) to assist NRC management in allocating resources used to inspect and assess licensee performance, and (4) to inform the public of NRC's assessment of licensee performance. NRC's SALP methodology assesses licensee performance in the areas of operations, maintenance, engineering and plant support. Through FY 1997, the NRC will continue to conduct SALP reviews for each reactor site on about an 18-month schedule, depending on licensee performance. In FY 1997, the NRC will issue approximately 45 SALP reports covering approximately 70 operating units each year.

The NRC evaluates the performance of nuclear power plant licensees through various coordinated processes. Performance evaluation involves the integration of information from a variety of sources and continuing NRC activities, such as inspections, enforcement actions, tracking performance indicators, analyzing trends, evaluating events, and examining licensed operators. Short-term assessments of performance are made at least twice each year through the plant performance review process. Senior NRC regional managers assess licensees' long-term performance through the SALP process. Senior management meetings overlay these processes and give agency senior managers an opportunity to review observations and findings, and plan a coordinated course of action for those plants whose performance gives the NRC the greatest concern.

The plant performance review (PPR) process is a semi-annual review conducted by the regional offices, with headquarters staff input, to provide a short-term evaluation of objective information and insights, to arrive at a current summary of overall plant performance. The PPRs are used to adjust the region's inspection plan (increasing or decreasing the number and scope of inspections) for plants and to distribute inspection resources among the plants over the upcoming 6 months. NRC staff integrates and assesses objective information for each power reactor licensee in the areas of plant operations, maintenance, engineering, and plant support, including insights regarding the licensees ability to identify, resolve, and prevent issues that degrade the quality of plant safety. Following each PPR, the staff issues to the licensee the revised inspection plan for the plant.

The senior management meeting (SMM) process is a semi-annual review and integration of the agency's observations and findings regarding nuclear reactors that culminates in a meeting of senior NRC managers, during which operating nuclear power plant safety performance is reviewed. The preparations for the SMM occur over the several months leading up to the meeting, during which NRC regional and Headquarters staff integrate licensing, inspection, and operating experience to

evaluate the safety performance of operating facilities, and to determine whether the licensees are finding and effectively correcting problems or if they are experiencing adverse performance trends. The review emphasizes the effectiveness of licensee self-assessment and corrective actions. The plants that are of most concern are slated for discussion at the SMM. The SMM process gives senior agency managers an opportunity to review the agency's observations and findings on operating nuclear reactors, and to plan a coordinated course of action for those plants whose performance is of most concern to the NRC.

The NRC's oversight of industry quality assurance programs provides another vehicle to ensure acceptable operational safety at nuclear power plants by determining the underlying causes of major operations-related problems and ensuring their timely detection and correction. The NRC will continue to develop and implement methodology, procedures, guidance, and training for NRC inspectors and technical staff. In addition, it will continue to support industry initiatives to perform critical self-assessments, that are designed to heighten licensee awareness and to enhance licensee ability to predict plant performance trends and resolve associated problems as early as possible. The NRC will conduct approximately 35 technical reviews of new and revised licensee quality assurance programs in FY 1997.

In addition to reviewing reactor performance at plants that have been operational for longer periods, the NRC must evaluate licensee performance and review licensee test programs for initial plant startup and for restart of plants that have been shut down.

The NRC's new performance-based maintenance rule will become effective on July 10, 1996. The Commission believes that safety can be enhanced by improving nuclear power plant maintenance across the industry and that effective maintenance must be sustained over the life of each facility. Through FY 1997, the NRC will continue to conduct inspections at selected licensee facilities to evaluate licensee implementation of the maintenance rule.

The NRC must license all personnel authorized to operate reactors. To fulfill this responsibility, the NRC currently administers initial and requalification examination programs, under which approximately 5,000 licensed power reactor operators are tested to evaluate their understanding of the facility design and their familiarity with the controls and operating procedures. These examinations consist of both written examinations and hands-on operating tests under simulated operating conditions.

Initial examinations are given to new operators at existing power reactor facilities to ensure that operating plants are staffed by qualified operators. The NRC plans to conduct approximately 550 initial examinations for power reactor operators in FY 1997. As part of the initial examination process, the agency will also conduct approximately 450 generic fundamentals examinations annually to measure the candidate's knowledge of reactor theory, plant components, and thermodynamics. In

April 1995, the Commission approved the staff's proposal to revise the initial examination process to require the licensees to prepare examination material for NRC review and approval. Presently, examinations are fully written by NRC staff and contractors. Pilot examinations and workshops with the industry are planned for FY 1996. The Commission will review the results obtained from the pilot examinations and workshops before making its decision on whether to revise the initial examination process.

In FY 1994, the Commission approved a change to the operator licensing rule that has enabled the NRC to more efficiently utilize its resources by inspecting licensees' requalification programs to verify continued operator proficiency rather than conducting individual requalification examinations. The NRC will continue to conduct requalification examinations at selected facilities "for cause" only — because of inspection results or licensee performance problems. In FY 1997, the NRC plans to inspect approximately 40 requalification programs.

Also included within the scope of operator licensing activities are efforts to resolve generic problems associated with operator licensing, to maintain an examination question bank, to review appeals pertaining to license denials, and to improve the proficiency of examiners/inspectors. Through FY 1997, various aspects of examination program implementation (including the newly developed examiner training syllabus, upgraded refresher training for examiners, and improved guidance for preparing and conducting examinations) will be evaluated.

The plant personnel training and human-systems interaction efforts included in this activity evaluate the ability of nonlicensed nuclear power plant personnel to meet job performance requirements; ensure that an effective mechanism exists to assess and improve, where necessary, the quality and effectiveness of licensee training programs (not including the licensed operator training program discussed above); and ensure that nuclear power plant operational events involving human performance receive a detailed analysis that will enable the root causes to be determined and corrections to be made.

The NRC continues to endorse the Training Accreditation Program managed by the Institute of Nuclear Power Operations (INPO). The staff will continue to participate in INPO's accreditation team visits and to observe the discussions of the INPO team representatives and the utilities before the National Nuclear Accrediting Board. The NRC will observe INPO training accreditation team visits at two sites in FY 1997. The NRC also plans to conduct approximately four training program inspections for cause to ensure program effectiveness.

The NRC will continue to provide project management oversight of all reactors in the decommissioning process, including reviews of all proposed license amendments, exemption requests, and decommissioning plans. Based upon recent experience with prematurely shutdown plants, the NRC has reviewed its regulatory process for decommissioning. The staff has clarified the

applicability of existing regulations to plants in the decommissioning process and expects to issue the final rule in FY 1996, reducing the need for licensees to submit exemption requests.

As part of its mission to ensure the public health and safety, the NRC must maintain the ability to ensure nuclear power facilities are properly protected against radiological sabotage and theft of nuclear materials. In its continuing effort to evaluate the threat environment, the NRC assesses all reported information on potential or actual threats worldwide; adversary characteristics, intentions, and capabilities of terrorist group activities; and any relevant domestic or foreign events of a nuclear or nonnuclear nature. A team of specialists is available to work with other Federal agencies to assess reported threats and to work with NRC licensees to respond promptly. Through FY 1997, the NRC will continue its trends analysis efforts and its program to review and evaluate threat information. The NRC will also publish annual revisions to the "Safeguards Summary Events List" (NUREG-0525).

Reactor and Site Licensing

The NRC ensures that nuclear power plants are designed and constructed properly and are ready for safe operation, and prepares for future licensing activities associated with new reactor designs and the reactivation of deferred reactors or potential new applications.

The NRC is responsible for reviewing applications for reactor construction permits and reactor operating licenses to evaluate their safety, environmental, and safeguards aspects, as well as their antitrust implications. In FY 1996, the NRC issued an operating license to Watts Bar Unit 1. At present, there are no construction permit or early site permit applications pending NRC review.

Through FY 1997, the NRC will focus on tasks in several siting and environmental areas including (1) revision to parts of the environmental standard review plan to reflect requirements in NRC regulations, regulatory guides, and technical specifications, and to update site suitability issues in areas such as the geosciences in which significant changes in technology and assessment methods warrant inclusion in the review guidance to the staff, (2) enhancement of geographical information and expert systems capabilities for site characterizations and license reviews, (3) development of regulatory guidance to implement (a) the revised reactor site criteria in 10 CFR Part 100 (scheduled for completion in FY 1996), and (b) the new source term insights for design basis dose calculations for new reactor designs and for operating nuclear power reactors, and (4) development of the framework for the alternative site review rule.

Reactor Aging and Renewal

As reactors age and approach the expiration of their operating licenses, the NRC must (1) be prepared to evaluate applications to renew current reactor operating licenses beyond their expiration dates, (2) understand the effects of aging on materials and systems, structures, and components, (3) ensure that required plant systems, structures, and components perform their intended functions and maintain their integrity and operability over the life of the plant, including a renewal term and (4) establish the technical requirements and regulatory framework for renewal of nuclear power plant operating licenses upon expiration of their current 40-year license term.

The NRC must be prepared to evaluate licensee applications to renew current reactor operating licenses beyond their expiration dates. This preparation involves determining technical and policy issues, resolving licensing issues, and defining the criteria and process to review such renewal applications. The NRC issued an amendment to 10 CFR Part 54, Requirements For Renewal of Operating Licenses For Nuclear Power Plants, that became effective on June 7, 1995. The amendment to the rule is expected to provide a more stable and predictable regulatory process for license renewal. Preparation of a regulatory guide has begun. Preparation of a standard review plan has also begun but will be finalized after the staff has gained implementation experience with the final rule based on the review of a few licensee renewal applications.

In a separate rulemaking, the NRC is revising 10 CFR Part 51, Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions, to enhance the agency's environmental review process for reactor license renewal. The final, revised rule is scheduled for publication in FY 1996. It is anticipated that a number of environmental issues previously identified for generic consideration in the proposed rule will be reclassified to require plant-specific analyses. The need for plant-specific analyses will increase the effort required to complete environmental reviews associated with license renewal applications. Upon completion of this rulemaking, the NRC will modify the environmental review regulatory guidance and standard review plan.

The NRC and the industry have concluded that a generic approach is needed to work through the license renewal process for the first time. The Babcock & Wilcox (B&W) Owners Group has submitted two of their planned generic reports and started discussions with the NRC on a license renewal program for B&W-designed facilities. Submittal of a license renewal application from a B&W member plant in FY 1997 is one of the objectives of this program. The Westinghouse and Boiling Water Reactor (BWR) Owners Groups are pursuing a similar approach. Each owners group has submitted the first of their generic reports; however, schedules are still being established for additional submittals from these owners groups. The Baltimore Gas & Electric Company (Calvert Cliff Units 1 and 2) has also asked the NRC to review its proposed program to implement the license renewal rule. The industry's generic programs will identify systems, structures, and components that

need to be reviewed and will determine if the effects of age-related degradation are being managed by existing programs or if additional analyses or actions are necessary.

Aging affects all reactor systems, structures, and components in varying degrees and has the potential to increase risk to the public health and safety if its effects are not managed. To ensure continuous safe operation of currently licensed reactors, the NRC will characterize aging effects, evaluate methods to detect age-related degradation, and evaluate the effectiveness of maintenance and repair practices to mitigate the effects and diminish the rate of degradation caused by aging. The NRC will accomplish this by reviewing design-related information and operating experience and by conducting experiments, as appropriate, on a wide variety of materials under a wide range of expected environmental conditions. The assessment of the safety implications of aging will be used as the basis for assuring continued safe operation and making decisions on extending reactor operation beyond the original license period of 40 years.

The NRC will continue to evaluate the analysis methods and data bases used in assuring the safety of the reactor pressure vessel. Fracture of the reactor pressure vessel which would result in a core-melt accident must be prevented by ensuring that NRC regulations provide adequate safety margins. The current safety margins are intended to cover uncertainties in analysis methods and material characteristics used in evaluating reactor pressure vessel safety. To ensure that a reactor can continue to operate safely during the 40-year license term and during an additional 20-year license renewal period, the actual behavior of pressure vessel materials exposed to typical operating conditions must be reflected in the licensees' safety analyses. In addition, the analytical methods and material data bases must be validated to ensure that appropriate margins of safety exist. Experimental and analytical research on the effects of the operating environment -- neutron irradiation, high temperatures, and exposure to the water coolant, operating stress, and the potential presence of flaws in the materials -- on the pressure vessel material will continue. This work is complemented by analytical research, coupled with experimental validation, to provide 'best-estimate' analytical tools for predicting more realistic safety margins for the reactor pressure vessel. The results of these research efforts will be used to provide assurance that reactor pressure vessels will not fail by fracture during service or in the event of an accident.

One of the more serious challenges to pressure vessel safety is the "pressurized thermal shock" (PTS) accident wherein a pressure vessel is subjected to a rapid cooldown coupled with relatively high pressures. The challenge is most serious for pressure vessels that have been significantly embrittled by neutron irradiation. This type of challenge has occurred in the past and the NRC promulgated a regulation (10 CFR 50.61 "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events") to limit the level of embrittlement unless analyses are performed to justify continued operation. The NRC has also issued regulatory guidance addressing the analyses to be used in evaluating the safety of continued operation beyond the PTS screening criteria. However, advances in the basic analysis methods, and difficulties in applying the existing regulatory guidance,

have resulted in a broad-based review of the guidance, including probabilistic risk assessment and thermal hydraulic systems issues. The NRC will continue the technical review of the PTS analysis methods, leading to publication of a draft revision to regulatory guidance in FY 1997. In support of the overall assessment of pressure vessel safety analysis methods, the NRC is conducting tests on a variety of unique specimens to evaluate the effects of potential accident and normal operational loadings on flaw sizes that could realistically exist in pressure vessels. In FY 1997, the NRC will develop, validate and evaluate computational models to predict effects of stainless steel cladding on potential fracture initiation and fracture-mode conversion from ductile to brittle on material fracture toughness of the pressure vessel beltline region. These tests will be completed in FY 1997, and the results will be combined with results from related work on analytical models validation to realistically describe fracture processes to provide comprehensive analysis tools for assessing pressure vessel safety.

Irradiation of the pressure vessel materials adjacent to the reactor core (the beltline materials), by neutrons escaping from the reactor core leads to embrittlement of those materials. This makes the pressure vessel more susceptible to fracture when subjected to operational or accident loading. The NRC's pressure vessel safety research program is addressing embrittlement on a broad basis. The research includes statistical analysis of the results from operating reactor material surveillance programs, carefully controlled test reactor irradiations to identify the key variables and material characteristics, highly sophisticated material evaluations to determine the microscopic mechanisms that control embrittlement, and validation of the embrittlement models and predictive equations through evaluation of materials removed from permanently shutdown reactors. In FY 1997, studies will be completed on the effects of irradiation on a commercial weld to evaluate the effects of typical variability in chemical composition and material properties on the predicted embrittlement. In FY 1997, the NRC will also complete mechanism studies and will develop and verify physical models for radiation hardening and embrittlement, and for correlations needed to update the calculation procedures for predicting changes in toughness of irradiated pressure vessels. This work is integrated with the International Group on Radiation Damage Mechanisms, which effectively leverages research in this area by taking advantage of the work performed in other countries. Additionally in FY 1997, the NRC will continue the work to evaluate the fracture toughness of pressure vessel materials, such as welds with a higher copper content, and will evaluate new, smaller test specimens for measuring fracture toughness directly from the material surveillance specimens. Also during FY 1997, the NRC will continue to maintain and update the data base of material surveillance test results which is used in evaluating the embrittlement prediction models incorporated into the regulatory process.

The NRC's research program has evaluated not only the causes of embrittlement but potential methods for mitigating its deleterious effects. Thermal annealing of the pressure vessel, where the temperature of the embrittled materials is increased above the normal operating temperatures and held for several days, has been shown to be an effective technique for reducing the effects of neutron irradiation. The NRC's research program is now validating models for predicting the reembrittlement

trends for pressure vessel materials that have been thermally annealed. The NRC's embrittlement validation research will lead to the testing of thermally annealed specimens in FY 1996 and the initiation of reirradiation of these materials. The reirradiation phase will be completed in FY 1997. Also, the NRC is participating with the Department of Energy (DOE), in the DOE Annealing Demonstration Projects (ADP) to investigate engineering feasibility of thermal annealing at two unirradiated sites with distinctly different reactor systems and annealing processes. The NRC's participation in the ADP during FY 1996 and early FY 1997 includes independent reviews, instrumentation installation, and analyses to confirm the work performed by the DOE contractors. It is anticipated that the results of the ADP will be used by a commercial power plant licensee in planning and justifying their annealing program.

The aging research program addresses not only the safety of the reactor pressure vessel, but includes evaluations of the causes and effects of age-related degradation of many reactor systems, components, and materials. Research is underway to evaluate the effects of the water coolant on the potential for cracking of key piping and other components that make up the reactor pressure boundary and other components important to the safe operation of the reactor. In FY 1997, the NRC will reissue NUREG/CR-5999, "Interim Fatigue Design Curves for Carbon, Low-Alloy, and Austenitic Stainless Steels in LWR Environments," to update the fatigue-life curves used in designing pressure boundary components. The revised report will provide curves that reflect the latest research results on the effects of operating temperature, loading history, and light-water reactor environments, and will provide guidance on the application of these curves to realistic plant situations.

In FY 1997, the NRC will identify the elements and processes which lead to irradiation-assisted stress corrosion cracking (IASCC) in stainless steels and related alloys; initiate testing on core-shroud samples; and identify the role of radiation-induced segregation and IASCC in core-shroud cracking. The NRC will also issue an analysis of the problems in aging nickel reactor components which have been welded and heat treated. During FY 1996-1997, the NRC will obtain access to a state-of-the-art industry crack-growth code, benchmark it by exercising it on available data for reactor internals, and use it to help assess licensee submittals on crack growth.

Steam generator tubes comprise more than fifty percent of the primary pressure boundary surface. Various forms of tube degradation have occurred since the inception of commercial operation of pressurized-water reactors. In recent years, various forms of environmentally-induced cracking have been most prominent. The NRC will conduct research to quantify the parameters responsible for this cracking, and on methodologies for inspecting and evaluating the continued integrity of degraded tubes. In FY 1996, advanced signal analysis methods for evaluation of degraded steam generator tubes will be validated and recommended for incorporation in the ASME Code Section V. In FY 1997, initial models will be developed for predicting leak rate and burst pressure as a function of operating conditions.

The NRC's regulations require periodic inservice inspection of important components, such as the primary piping and the pressure vessel. The research program includes efforts to evaluate inspection procedures and the overall inspection programs as they are implemented by the ASME Code. In FY 1996, the NRC will recommend upgrading ASME Code and regulatory positions to reflect the results of the International Program for the Inspection of Steel Components (PISC III). Code adoption will be pursued in FY 1997. In FY 1997, the NRC will complete round-robin inservice inspection studies of the reactor pressure-vessel core shroud which will provide probability of detection and sizing accuracy data for inspections conducted with commercial teams and methods.

In FY 1996, NRC findings of a comprehensive review of published documents related to the environmental qualification (EQ) of safety-related electric cables used in commercial nuclear power plants will be published. This review and analysis was necessary to assess the work completed by various institutions and organizations both domestic and foreign, learn from past experience, avoid duplication, and maximize available resources. In FY 1997, the results from the literature review and analysis will be utilized for determining which EQ-related technical issues can be resolved with existing information and which will require further research. The results will have a direct bearing in formulating experiments and test plans and programs for the evaluation of cable condition monitoring methods and determining the survivability of naturally-aged cables under Loss-of-Coolant-Accident (LOCA).

In FY 1997, the NRC will continue to test artificially-aged and naturally-aged cables to (1) assess the validity of current qualification methods, (2) evaluate the adequacy of accelerated aging techniques, and (3) evaluate methods for in situ cable inspection and condition monitoring. The test results will provide the technical basis and support to the NRC's regulatory staff on matters related to the EQ of electric cables for the current license term and for license renewal considerations.

In FY 1997, technical bases will be developed and provided to the NRC's regulatory staff for understanding valve and motor-operator behavior under pressure locking and thermal binding conditions. The results will support NRC regulatory needs for evaluating licensees' responses to Generic Letter 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," and prioritizing and extending test and inspection intervals of motor-operated valves (MOVs) and check valves based on risk. Development of a technical basis for determining motor-operator margins required to counter the detrimental effects of valve and motor-operator aging degradation will be completed in FY 1997.

In FY 1997, most licensees will complete their programs to verify the design-basis capability of MOVs in response to GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance." The NRC will be conducting inspections and reviewing licensee submittals to close the NRC review of GL 89-10 programs at individual facilities. In FY 1996, the NRC will issue safety evaluations on topical reports describing the EPRI MOV Performance Prediction Methodology and the BWR

Owners' Group methodology for using probabilistic risk assessments to rank MOVs for testing purposes. Also in FY 1996, the NRC will propose issuance of a new generic letter on periodic verification of the design-basis capability of safety-related MOVs. Review of licensee responses to this generic letter will be conducted in FY 1997. In FY 1996, the NRC will review licensee responses to GL 95-07, which requests licensees to ensure that safety-related power-operated gate valves that are susceptible to pressure locking or thermal binding are capable of performing their safety functions. In FY 1997, the NRC will issue an inspection module for inspecting MOV programs over the long-term and provide appropriate training for inspectors.

In FY 1997, the NRC will propose amendments to 10 CFR 50.55a, "Conditions of Construction Permits, Codes and Standards," to: (1) update the reference to the 1995 Edition of the ASME Boiler and Pressure Vessel Code as the latest edition incorporated into the regulations, (2) incorporate by reference into the NRC regulations the ASME Code for Operation and Maintenance of Nuclear Power Plants, 1995 Edition, which provides rules for inservice testing of pumps and valves, (3) establish rules and regulatory guides to allow for voluntary use of NRC-approved alternatives; (4) expedite implementation of the rules for performance demonstration of ultrasonic examination systems that are contained in Appendix VIII, Section XI, of the ASME BPV Code, to require more effective ultrasonic examinations, and (5) based upon new industry input, remove the modification in 10 CFR 50.55a that applies to ASME rules for inservice testing of containment isolation valves.

Reactor Safety Assessment and Regulation Development

This activity is conducted to (1) provide an indepth examination and understanding of abnormal operating events and plant transients experienced by the nuclear industry including evaluations of overall plant risk; (2) understand and provide a technical basis for acceptance of operator/control-system designs considering effects on human and total systems performance, (3) understand ways to prevent and mitigate the consequences of severe core damage or core-melt accidents; (4) improve the NRC's ability to evaluate the potential effects of earthquakes on reactor operations; (5) assess the adequacy of safety margins in the current analysis methods used to ensure reactors can continue to operate safely; and (6) manage the development of revised reactor-related regulations, policy statements, and regulatory guides that incorporate research results and lessons learned from operating experience.

Understanding safety-significant abnormal operations and plant transients experienced by the nuclear industry is an important element in the Commission's continuing efforts to maintain an adequate margin of safety as operating plants continue to age. Analysis of these operating events requires information on the processes of heat transfer and fluid flow (the thermal-hydraulic response) of the reactor coolant system over the range of plant transients and accidents that could potentially occur. These events include design-basis accidents (required to be analyzed in license applications),

non-design-basis events such as multiple-system or component failures, common mode failures, and operator errors that have been revealed through probabilistic risk assessments and operating experience.

Plant performance research is being conducted by the NRC to provide validated methods by which the staff can evaluate design-basis accidents, the safety implications of actual operating events and hypothetical transient scenarios determined to be major contributors to risk as shown by probabilistic risk assessment studies and past operating events. This work is focused on integrating experimental data and associated calculations into a firm technical basis to support regulatory actions such as modifications to plant technical specifications, reviews of accident management plans, or remedial actions responding to operating events. The principal products of this research are analytical tools (computer codes) used to understand and predict the plant response to deviations from normal operating conditions. The capability of the computer codes to predict plant response with an acceptable uncertainty is augmented by validating the codes using (1) basic experiments to derive empirical formulas for determining coolant system behavior under postulated transients, (2) separate-effect experiments to evaluate the code predictions for a single, complex component, and (3) integral system experiments to evaluate the code predictions for a complete reactor system.

In FY 1997, the NRC will continue archiving and retrieving experimental thermal-hydraulic data from the established experimental data bank. The data bank contains test data from domestic and foreign thermal-hydraulic related experiments and plant startup and operational transient data. The data bank is a central repository of qualified results in a standard format and includes over 800 digital magnetic tapes that can be readily accessed by the staff to support specific licensing actions.

In FY 1997, the NRC will continue to maintain and improve the TRAC-PWR and RELAP5 computer codes. RELAP5 is a light-water reactor transient analysis code used to support rulemaking and to evaluate generic safety issues, audit license submittals, and analyze unresolved safety issues. RELAP5 is also a basic component of the Nuclear Plant Analyzer (NPA). The NPA is operational at NRC Headquarters to provide an in-house analysis capability to evaluate accident management strategies, advanced reactor design capabilities, and significant abnormal events in operating reactors. The NRC will continue to develop and maintain a representative set of plant input decks to support the use of the NPA. Other thermal-hydraulic codes (TRAC-BWR, RAMONA-3B) will also be maintained to ensure these codes reflect the latest results of foreign and domestic safety experiments and recent operating events. The TRAC-PWR code is for PWR non-small-break loss-of-coolant accidents (LOCA) analyses, whereas TRAC-BWR and RAMONA-3B codes are for BWR analyses. RELAP5 can analyze PWR or BWR plant small-break LOCAs under a variety of accident or transient conditions. The TRAC, RELAP5, and RAMONA-3B codes will also be used to analyze new reactors of advanced design. That effort is discussed in the Standard Reactor Designs Cost Center.

REACTOR PROGRAM: Reactor Regulation

The NRC will continue to contribute to the Code Applications and Maintenance Program, an international program among members of the international nuclear safety community who use and support this code maintenance and updating activity. In FY 1997, the NRC will perform analyses or experimental assessments to determine the scope and magnitude of potential safety issues that could arise as a result of operating events, staff reviews, or ACRS reviews. Recent examples of work in this area include studies of pressurized thermal shock, BWR stability under anticipated-transient-without-scram conditions, long-term cooling after a loss-of-coolant accident, and shutdown cooling after the loss of the residual heat-removal system.

In FY 1997, the NRC will continue to support thermal-hydraulic test loops at Purdue University, the University of Maryland at College Park, and Oregon State University.

Experiments will continue to be performed during FY 1997 to better characterize the behavior of fuels irradiated to the higher burnup levels being proposed by the industry. This work, which includes cooperative programs at the Halden Reactor project, will provide the basis for revising fuel behavior codes used by NRC and the industry.

Experience has shown that most safety-related events reported at nuclear facilities involve human performance. To reduce human errors, and thereby reduce the risk to the public from the accidental release of radioactive material, the NRC needs to (1) understand the root causes of human error during reactor operations and maintenance, (2) develop methods to assess the effects of the design and qualification of instrumentation and control system displays on human performance, and (3) analyze the effectiveness of the interface between the nuclear power plant system and the human user in improving operator performance. Research results will be used to identify, systematically prioritize, and suggest solutions to human performance issues in the maintenance and operation of nuclear facilities during normal, abnormal, and emergency situations.

The NRC will continue research to address the safety issues associated with the nuclear power industry's current and planned use of artificial intelligence and computers in reactor and safety system operation and control and, in FY 1997, will develop the technical bases for adopting appropriate licensing criteria for application of these new technologies. In FY 1997, the NRC will complete an update to Standard Review Plan, Chapter 7, which incorporates new criteria and guidelines for review and acceptance of computer-based instrumentation and control systems in nuclear power plants.

Also in FY 1997, the NRC will continue participating in the Organization for Economic Cooperation and Development (OECD) Halden Reactor Project. The valuable technical information gained from this 15-year project will help establish guidelines and criteria for reviewing advanced human-control system interfaces, computer-based operator support systems, integrated surveillance and control rooms, and the verification and validation of computer software. In FY 1997, work will continue on developing human factors review guidelines for system modifications that involve mixing digital and

conventional displays and controls. Also, the effects of secondary workload on operator performance from the need to navigate through CRT (cathode-ray tube) displays will be assessed and review guidelines will be developed. Root cause investigation techniques associated with human error will be enhanced based on experience from use of the human performance investigation process (HPIP) and the results of other research efforts. Because the availability to collect large amounts of human behavior data at nuclear power plants is limited, the use of computerized modeling/simulation of human behavioral processes will continue to be explored.

In addition to routine operations, the NRC is also concerned about severe reactor accidents. Severe accidents have the potential to adversely affect the public health and safety by accidentally releasing radioactive fission products to the environment. NRC efforts are directed toward reducing the risk of nuclear power plant accidents by requiring design and operating strategies to prevent or ameliorate their consequences. The NRC accomplishes this by (1) improving our understanding of severe-accident phenomena, (2) identifying and evaluating methods to prevent and/or mitigate the consequences of severe accidents; (3) developing methods and tools to analyze the frequencies, consequences, and risks associated with severe accidents; (4) ensuring the adequacy of safety margins in the current methods of evaluating containment integrity under severe-accident conditions; and (5) determining whether severe-accident research results warrant revisions to NRC regulations or policies. Results of these efforts will be applied in staff reevaluations of siting and emergency planning requirements and implementation of the individual elements of the Commission's severe-accident, safety goals, and backfit policies.

To improve our understanding of severe-accident phenomena, the NRC has completed direct containment heating (DCH) experiments on the simulated Zion- and Surry-type reactor configurations. The NRC will perform additional experimental work for Combustion Engineering-type plants through FY 1996 to confirm the physical processes which comprise the DCH phenomenon and other severe-accident phenomena affecting the loss of containment capabilities during severe accidents. During FY 1997, the NRC will continue to apply the severe-accident scaling methodology (SASM) to any experimental or analytical program designed to assess DCH and, when practical, will apply SASM to other NRC-sponsored experiments. This work will ensure that the results of experiments can be confidently extrapolated to full-scale reactor conditions.

During FY 1997, the NRC will continue research to address the conditions under which hydrogen-air-steam mixtures at high temperatures, produced during severe accidents, could sustain low-speed combustion. This research will address the applicability of existing models for hydrogen combustion during certain severe accidents. In FY 1997, the NRC will continue to support large-scale hydrogen combustion experiments at the Russian Research Center to provide insights on the placement of hydrogen igniters inside the containment.

REACTOR PROGRAM: Reactor Regulation

In FY 1997, the NRC will continue to participate in the RASPLAV international safety research project under the auspices of OECD. The RASPLAV program consists of both experimental and analytical investigations of melt and reactor pressure vessel (RPV) lower-head interactions. The experimental program includes experiments utilizing up to 200 Kg of UO_2 ceramic melt in a geometry representing the lower head of the RPV. In addition to these experiments, a number of important separate effect experiments will be conducted as part of this program. These experiments include measurement of thermo-physical properties of different ceramic melt compositions. In a closely related project, the NRC will continue research in FY 1997 to investigate heat transfer mechanisms between water and debris in the lower head that could provide cooling of the RPV lower head during a severe accident. Such cooling mechanisms were postulated to have resulted in enhanced cooling of the lower head during the TMI-2 accident, thereby preventing the RPV from failing via creep rupture.

During FY 1997, the NRC will continue to participate in the FARO experimental program carried out in the FARO/KROTOS facilities at the Joint Research Center in Ispra, Italy. The FARO facility is being used to perform large-scale tests to address the residual issues related to fuel-coolant interactions, particularly ex-vessel fuel-coolant interaction. In the FARO facility, prototypic material (corium, the term used for a molten mass of fuel from the core) is brought into contact with water in a vessel of representative size and strength. The NRC will obtain data on the rate of heat removal from the corium melt, the effectiveness of various quench mechanisms, melt spreading, the hydrogen generation rate, and the heat loading and temperatures of a simulated reactor pressure vessel. Smaller scale tests in the KROTOS facility provide detailed data on the conditions leading to and propagation of steam explosions which may be used to validate mechanistic models.

During FY 1997, the NRC will continue to use the VICTORIA fission product release and transport code and the MELCOR code to perform pre- and post-test analyses of the PHEBUS tests being carried out by the French Commissariat à l'Énergie Atomique (CEA). The analyses will be part of the NRC in-kind assistance and services to PHEBUS under the international cooperative agreement between the NRC and the CEA. The NRC will continue to provide technical assistance and cooperation with the Commission at the European Communities fission product behavior program in the French PHEBUS test reactor. Such technical assistance includes providing an online fission product measurement system, reviewing test plans and testing, and other assistance, as needed.

In addition to experimental work, the NRC is developing analytical codes capable of modeling the severe accident phenomena. In FY 1997, the NRC will continue to maintain and make modeling improvements, as necessary, to the following severe-accident codes: MELCOR, SCDAP/RELAP5, CONTAIN, and VICTORIA. The NRC will continue to compare codes with the existing database and assess progress in reducing uncertainties in our understanding of severe-accident phenomena. In FY 1997, the NRC will continue to contribute to the internationally supported MELCOR Cooperative Assessment Program that supports MELCOR code validation and maintenance.

In FY 1996, the NRC will assimilate results and insights from all the available major experimental programs (ACRR, TMI, LOFT, PBF, NRU, CORA, PHEBUS) to identify the need for additional experimental testing during FY 1997 in the severe fuel-damage assessment program.

During FY 1996-1997, the NRC will continue assessing the data obtained from the CABRI (France), IGR (Russia), and NSSR (Japan) test facilities on high burnup fuel. In FY 1997, the NRC will assimilate results and identify the need for changes to current regulations.

The NRC continues to undertake a number of activities intended to increase the consideration of risk significance in its decision processes through the effective use of risk-informed, performance-based technologies such as probabilistic risk assessment (PRA). On August 19, 1994, the NRC staff issued a "Proposed Agency-Wide Implementation Plan for PRA." The staff updated this agency plan on March 30, 1995, to reflect lessons learned during the initial implementation activities. The plan will be updated on a regular basis and at least annually. The NRC also issued a final policy statement, "Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (60 FR 42622) on August 16, 1995.

The NRC is currently engaged in pilot projects with several utilities aimed at developing methodologies for ranking the relative risk importance of structures, systems, and components (SSCs) in a plant. Risk ranking is a central issue for many risk-informed, performance-based regulatory initiatives such as graded quality assurance (QA), inservice inspection (ISI) and inservice testing (IST)). As experience is gained through these pilot activities, the NRC will document the lessons learned and draft regulatory guidance. While some of these pilot programs will be completed in FY 1996, others will not be completed until the end of FY 1997 and early FY 1998.

The NRC staff is currently working with the Combustion Engineering Owners Group and Northeast utilities on a pilot program to extend allowed outage times (AOTs) for a selected set of systems on the basis of a combination of PRA and deterministic based considerations. While this particular pilot program is expected to be completed at the end of FY 1996, the NRC expects to continue to review industry submittals pertaining to risk-informed technical specification improvements in FY 1997. The NRC expects to continue to work with owners groups and individual licensees to implement pilot programs for risk-informed technical specification improvements. Acceptability of the improvements will be documented in safety evaluations. The results of pilot programs will be used to develop generic guidance for the development and implementation of risk-informed technical specifications.

In FY 1996-1997, the NRC will be developing guidance, standards, and decision criteria for applications of risk-informed, performance-based analysis techniques in regulatory decisions. These regulatory guidance documents will include new or updated chapters to the Standard Review Plan (SRP), regulatory guides and inspection procedures. The SRP and regulatory guides applicable to

PRAs will improve the quality and acceptability of standards to ensure a consistent and appropriate application of such methods to allow for more risk-informed decision-making.

In FY 1997, in support of increased agency use of risk analysis in regulatory decisions, the NRC will continue developing methods for applying advanced human reliability, organizational performance, and aging models, and operational data in probabilistic risk assessments (PRA). Risk-informed, performance-based models will continue to be developed and applied to support agency analysis of operational events, using the SAPHIRE code. Also in FY 1997, the NRC will continue to maintain, support, and upgrade (as necessary) the severe-accident risk analysis computer models, such as MACCS and SAPHIRE. Risk analyses performed by staff and contractors in support of the assessment of safety issues will be reviewed. The NRC will continue to support the development of staff expertise in the application of PRA.

In order to develop more reliable estimates of containment capacity to assess the potential consequences of severe reactor accidents, model tests will be conducted. Research performed previously provided bases for estimating the likely failure modes of steel and reinforced concrete containments used for PWR plants. Current research involves a cooperative effort with the Ministry of International Trade and Industry (MITI) of Japan to develop bases for estimating capacities for other containment designs. Two areas of cooperative research are being pursued--one including steel containments used in both the United States and Japan for BWR designs, the other relating to pre-stressed concrete containments. The current generation of Japanese PWR containments are of a pre-stressed concrete design. In the United States, there are 41 pre-stressed containments compared to 20 reinforced concrete containments.

The steel containment vessel test specimen is a scale model representing some features of an improved BWR Mark II containment vessel in Japan. The model was fabricated at the Hitachi Works in Japan and has been installed in the United States in the protective structure within which the test will take place and instrumentation of the model is in process. The test to failure is scheduled for fall 1996.

The pre-stressed concrete containment vessel (PCCV) model will be a scaled representation of an actual PCCV in Japan, which was designed in accordance with the Japanese Concrete Containment Vessel Design Code. The basic design of the PCCV model was completed in December 1994. Fabrication of the liner by Mitsubishi Heavy Industries in Kobe, Japan began in April 1995 and will be completed in 1996. The liner segments will be shipped to the United States and construction of the model will take place during 1996-1998. Instrumentation of the model will be conducted in 1998-1999, partly in parallel with the on-site model construction. Testing of the PCCV model will then take place late in 1999.

Recent experience and research results suggest that corrosion effects may significantly degrade the margin that containments have to accommodate design basis accidents and beyond. Evidence of corrosion has been found in Mark I BWR containments, ice condenser PWR containments, and the liners of concrete containments. The robustness of undergraded (un-aged) containments is a major consideration in the Commission's Severe Accident Policy. However, we need to understand the significant factors relating to occurrence of corrosion, efficacy of inspection, and potential capacity reduction to be able to formulate regulatory requirements that will assure the continued availability of sufficient containment capacity as plants continue to age. Comparison of remaining thickness against minimum ASME Boiler and Pressure Vessel Code requirements will be assessed. If the remaining thickness exceeds the limit, adequate margin exists. Methods, utilizing the results of research on actual failure modes of containments, are being examined to relate containment capacity to amount and location of degradation. The objective of this effort is to provide a basis for judging the seriousness of degradation at a particular location.

In a continuing program, the NRC is assessing state-of-the-art, nondestructive testing techniques for examining steel containments and the liners of concrete containments. As part of this program, statistically-based sampling plans will be developed to provide confidence limits on detection of corrosion occurrence. One subtask scheduled to be completed in the third quarter of FY 1996 is a program assessing nondestructive examination techniques that can be used to determine if degradation has occurred in inaccessible areas of the containment wall. The need for further assessment of nondestructive examination techniques in FY 1997 will be determined after evaluating the recommendations contained in the final report. In a parallel effort, the NRC is investigating the capability of analytical methods to account for the effects of corrosion on the capacity of steel containments to withstand static internal overpressurization loads.

The Commission's Severe Accident Policy calls for the examination of individual plant susceptibilities to severe accidents and the identification and evaluation of potential improvements. This program is called the Individual Plant Examination (IPE) program. In FY 1996, the NRC will continue the joint RES and contractor team reviews of the remaining internal event IPE submittals covering all units. By the end of FY 1996, all or most of the internal event IPE reviews will be completed. During FY 1996-1997, the NRC will continue to analyze the information from the review of the IPE submittals, categorize insights, and provide the results in a concise report. The results of that review will also be used to review existing regulations and ensure that they are adequate to protect the public health and safety. In FY 1997, the NRC will continue reviewing licensee external event evaluation (IPEEE) reports and collecting and interpreting the supporting data for more general perspectives and use in the agency's risk-informed, performance-based regulation activities.

A limited number of efforts to improve the NRC's ability to evaluate the effects of potential earthquakes on nuclear power plant operations are being supported. The results of this program are integrated into efforts to develop a unified seismic hazard assessment method. In FY 1997, the NRC

will determine magnitude, scaling, and distance attenuation relationships using regression analyses and ground motion data sets from Eastern and Western U.S. earthquakes. These analyses will yield more physically based estimates of site effects than previous studies and will reduce uncertainties in the seismic hazard and ground motion estimates. This, and information from earth sciences research, will keep the staff informed of advanced knowledge and new field observations. As a result of the limited available recorded data in the U.S., each earthquake provides new insights and new potentially significant information. Such information may prompt NRC to reevaluate earlier licensing decisions or confirm assumptions made in earlier decisions.

In FY 1997, the NRC will continue to support research activities of the U.S. Geological Survey (USGS) that address geological and seismological issues of regulatory significance, such as strong ground motion studies, fault segmentation studies and faulting, and paleoseismic studies in the New Madrid seismic zone. The NRC will support the USGS efforts to develop a correlation between the seismic characteristics of near-field geologic materials and the observed response, in order to investigate the influence of near-surface geology on seismic site response. Results of this program will lead to an improved modeling of the wave scattering and propagation effects in the near surface material and will reduce uncertainties in the ground motion estimates at the site. These results will also be used in the unified seismic hazard assessment program, as applicable.

The NRC will also continue to evaluate and analyze the data collected from the National Seismographic Network, a long-term project to continuously improve the understanding of physical processes associated with the seismic activities, transmission of seismic energy, and site responses. The new data will enable the staff to develop and validate more accurate models to predict the transmission of seismic energy. The new models will reduce the uncertainty of current ground motion modeling and also improve upon the NRC's implementation of site licensing criteria and evaluation of seismic issues bearing on plant design.

In FY 1997, the NRC will continue to determine attenuation characteristics of ground motion through shallow soils over bedrock. The data from small-to-moderate earthquakes will be obtained from seismographs installed at various levels in boreholes at Anza, California. The better modeling of the local site amplification phenomenon will reduce major uncertainty in the soil structure interaction analysis currently carried out to estimate the structural and component responses.

In FY 1996, the NRC completed a cooperative effort with DOE, who has an agreement with Electric Power Research Institute (EPRI) to develop guidelines for a unified seismic hazard assessment method to characterize seismic hazard east of the Rocky Mountains based on seismic hazard studies from EPRI and Lawrence Livermore National Laboratory (LLNL). The results of this cooperative effort will be used to assess the seismic hazard of future nuclear power plant sites and to recalculate the probabilistic seismic hazard of all operating Eastern U.S. nuclear power plant sites as bases for probabilistic siting criteria for future nuclear power plants. The National Academy of Sciences will

also complete a review of the unified hazard assessment methodology. A final report incorporating all comments will be completed in FY 1996. During FY 1996-1997, the NRC will recalculate the probabilistic seismic hazard at several Eastern U.S. nuclear power plant sites as a trial implementation of the guidelines.

In FY 1997, the NRC will continue to obtain data to evaluate the performance of structures, systems, and components when subjected to natural hazards such as earthquakes, high winds, and floods. In the 1970's and before, the NRC interest in nuclear power plant seismic design was focused on the response at design level loadings that was primarily based on analytical techniques (not experiments) and assumptions. Since the 1980's as new seismological information and research results became available, the seismic design bases of operating plants has been questioned. A considerable effort was made to improve predicted response of nuclear power plants to earthquakes greater than those considered in design; at issue is whether potential changes to the design bases can be accommodated within the inherent capacity of the original design or whether plant modifications are necessary. The data from this research will be utilized to help assure the safety of nuclear power plants by enabling the NRC to (1) evaluate calculational methods used in the analysis, (2) assess actual performance of structures, systems, and components in past earthquakes, and (3) validate design codes and probabilistic risk assessment (severe accident) techniques. These data have enabled the NRC to implement the resolution of generic issues such as USI A-46, "Seismic Qualification of Equipment in Operating Plants," and develop positions and guidance for external event evaluations at operating nuclear power plants to identify severe accident vulnerabilities.

In FY 1997, the NRC will use data from NRC- and industry-sponsored tests on structures, piping systems, and components, and data obtained from actual earthquakes to revise NRC's damping recommendations. Specifically, the NRC has participated in activities of the American Society of Mechanical Engineers (ASME) to revise the pipe damping criteria in Appendix N of Section III of the Boiler and Pressure Vessel Code. The NRC is also reassessing the values of damping for major plant structures. Changes to some values appear to be appropriate.

In a joint venture with EPRI and the Taiwan Power Company, a cylindrical concrete model structure was built in a seismically active area near Hualien, Taiwan. The model and surrounding soil will be instrumented and data recording and analysis will be conducted during FY 1996-1997.

During FY 1996-1997, the University of Texas at Austin will continue to perform tests to determine the behavior and strength of anchor bolts used in concrete for earthquake type loads. This work supports the implementation of NRC seismic program USI A-46. In FY 1997, the NRC will consult with national standards committees for any necessary revisions.

In cooperation with MITI of Japan, the NRC will participate in a seismic test of a large-scale model of a main steam and feedwater system to check calculational methods and validate seismic failure

mode assumptions. The test will be performed at Tadotsu Engineering Laboratory, the largest seismic shaking table facility in the world. In FY 1995, the fabrication of the large-scale model was completed and the test was conducted. In FY 1996-1997, the resultant test data will be evaluated and post-test analyses will be performed to verify and calibrate analytical techniques used for design and margin evaluations

During FY 1997, the NRC will continue to participate in an OECD program on International Standard Problem (ISP) on shear walls. In this program, results of two large-scale shear walls tests conducted in Japan will be used to verify analyses and modeling techniques used by participants. Beginning in FY 1996, this program will also be extended to include ISP on the soil-structure interaction (SSI) analyses. In FY 1997, calculations will be performed for the SSI ISP and discussed in a workshop.

During FY 1997, in a collaborative arrangement with MITI and the Nuclear Power Engineering Corporation (NUPEC), the NRC will participate in seismic tests of large-scale concrete and prestressed concrete containment structures to check calculational methods and performance of the containment and liner during shaking. The design, fabrication, and construction will be completed in FY 1996 with tests conducted during FY 1996 and FY 1997. In FY 1997, NRC will perform pre- and post-test analyses while NUPEC will conduct tests at Tadotsu Engineering Laboratory in Japan.

Once research projects are completed, the results are incorporated into the regulatory process as expeditiously as practicable. This involves (1) resolving generic safety issues related to reactor and plant system design and plant operations; (2) developing regulations, policy statements, and regulatory guides for nuclear power plant regulation; and (3) developing the technical basis for radiation protection standards to minimize the adverse consequences of exposure to ionizing radiation from licensed reactor activities. Changes to regulatory requirements, policy statements, and guidance for reactor facilities are closely coordinated with other NRC offices, the nuclear industry, and the public.

Generic safety issues (GSIs) involve safety concerns that may affect the design, construction, or operation of all, several, or a class of reactors or facilities and may have potential for safety improvements and issuance of new or revised requirements or guidance. Resolutions of GSIs are transmitted to the industry through issuance of generic letters, information notices, or rule changes. Implementation procedures for resolving GSIs are occasionally developed in conjunction with organizations such as the Nuclear Energy Institute and nuclear plant owners groups.

The staff will report to the Commission annually on the resolution of GSIs. Each year all remaining GSIs will be reviewed for appropriateness of previous prioritization and newly identified issues will be prioritized. In FY 1997, one generic safety issue is scheduled to be resolved.

Generic Safety Issues Scheduled for Resolution by Fiscal Year

Issue Priority	Fiscal Year 1997	Fiscal Year TBD*	Cumulative Total
High	0	2	2
Medium	1	0	1
Nearly Resolved	0	3	3
Total	1	5	6

* To be determined

Semiannually, the NRC will perform an integrated review of the priorities and schedules for all rulemaking activities to ensure that the highest priority efforts are conducted. The majority of rulemaking efforts are oriented toward regulatory reform, regulatory burden reduction, or codifying those alternatives yielding greater flexibility to the regulated entities. Some of the rulemaking activity involves safety enhancement. For each rule, a regulatory analysis will be performed to assure that the rulemaking is cost beneficial.

During FY 1996-1997, the NRC will conduct reactor-related rulemakings and issue proposed or final rules and the associated regulatory guides, where applicable, for the following rulemakings which either reduce regulatory burden or provide licensees greater flexibility in meeting safety requirements. (1) Scope of Environmental Effects for License Renewal, 10 CFR Part 51; (2) Revise Physical Protection Requirements for Nuclear Power Plants, 10 CFR Part 73.55; (3) Design Certification for Advanced Boiling Water Reactor and System 80+, 10 CFR Part 52; (4) Emergency Planning and Preparedness Exercise Requirements, 10 CFR Part 50; (5) Minor Amendments to 10 CFR Parts 2 and 51; (6) General Revisions to the Fitness-For-Duty Rule, 10 CFR Part 26; (7) Employee Allegation Protection, 10 CFR Part 19; (8) Performance-Oriented Requirements for Fire Protection of Nuclear Power Facilities, 10 CFR Part 50; (9) Deliberate Misconduct Rule, 10 CFR Parts 30, 40, 50, 60, 61, 70, 72, 120; (10) Antitrust Review of License Applications, Part 50 Appendix L; (11) Eliminate Obsolete Requirements, 10 CFR Part 53; (12) Audit Frequency for Emergency Planning and Security, 10 CFR Part 50; (13) Revision of Table S-3 and Table S-4 in 10 CFR Part 51, Addition of Radon-222 and Technetium-99 Values; and (14) Shutdown and Low-Power Operations, 10 CFR Part 50. In addition, RES will conduct a safety enhancement rulemaking on ASME Codes and Standards for Nuclear Power Plants, 10 CFR Part 50.

During this time the NRC will also commence work to prioritize and evaluate approximately 90 rules identified as candidates for revision or elimination through the agency's participation in the National Performance Review. The NRC will continue to implement changes in these and other existing reactor regulations and regulatory requirements that have a large economic impact but that can be eliminated or modified without significantly reducing safety. These changes will allow licensees to redirect resources to more important safety issues. Specific rulemaking activity that will be conducted include (1) Change to Insurance Requirements for a Possession Only License, 10 CFR Parts 50 and 140, (2) Requirements for Decommissioning Cost Updates, 10 CFR Part 50 75, and (3) Steam Generator Tube Integrity, 10 CFR Part 50.

In FY 1997, the NRC will develop a proposed rulemaking that will establish performance criteria to control "hot particles" contamination of the skin. The NRC previously exercised enforcement discretion and provided flexibility through guidance in the application of dose limits to hot particles. The NRC will use its contractor's findings and evaluate reports on this subject by the National Council on Radiation Protection and Measurements (NCRP) and the International Council on Radiological Protection (ICRP) to initiate appropriate rule changes to codify the burden relief now given through enforcement discretion. The NRC will also develop performance criteria, and testing and accreditation criteria for extremity dosimetry.

In FY 1997, the NRC will continue to support the review and analysis of health effects information and provide research and operational support funds for the working groups of the ICRP, the NCRP, and the National Academy of Sciences. These organizations are developing and coordinating recommendations on a wide variety of subjects in radiation protection, including hot particles, potential exposure situations, and dose-risk relationships, all of which are used by the NRC in assuring continued safety of workers and the public.

In FY 1997, the NRC will continue to provide annual statistical summaries of worker radiation exposure data as part of the Radiation Exposure Information Reporting Systems, and will continue to process termination reports and implement the new 10 CFR Part 20 reporting requirements. The NRC will work with the National Cancer Institute and other organizations to develop and implement a national worker exposure database to support health effects studies. The NRC will continue to monitor health effects research and operating experience.

In FY 1997, the NRC will monitor and document cost data needed to issue addenda to NUREG-1307, "Nuclear Power Reactor Decommissioning Costs." These addenda will ensure licensees have the latest waste burial costs that are corrected for inflation. These reports will provide the basis for reactor licensees to commit sufficient, but not excessive, funds for safe decommissioning.

Independent Analysis of Operational Experience

The Office for Analysis and Evaluation of Operational Data (AEOD) identifies, evaluates, and responds to potentially significant events and safety concerns involving U.S. commercial nuclear power reactors, based on events reported to the NRC by its licensees. It also supports the agency's Committee to Review Generic Requirements (CRGR), whose efforts include review of generic reactor requirements and backfit considerations.

AEOD oversees the agency's incident and accident investigation programs to ensure that significant and extraordinary safety-significant operational events involving nuclear power reactors licensed by the NRC are investigated in a systematic and technically sound manner and that information is obtained on the causes of the events, including those involving NRC activities, so that the NRC can take corrective actions that are timely and effective. For events that could be of major significance, an Accident Review Group or Incident Investigation Team is established that is independent of the region and the program office. For investigating less significant operational events, an Augmented Inspection Team is established under regional direction and complemented by headquarters personnel, as necessary. During FY 1997, the NRC will support Incident Investigation Teams (IITs) as required; maintain the Incident Investigation Program Management Directives, associated manuals, and IIT rosters, and incorporate the lessons learned from completed IITs; and periodically train IIT roster members and leaders. The NRC will continue to independently review the adequacy of the resolution of staff actions assigned by the EDO for IITs and document the status of IIT-initiated staff actions until they are closed. The NRC will also implement and maintain the programmatic actions needed to activate and support an Accident Review Group reporting to the Commission to respond to an event of extraordinary safety significance at a licensed reactor facility.

In FY 1997, the NRC Diagnostic Evaluation Program (DEP), will be terminated. Diagnostic evaluations and special evaluations will be supplanted by the conduct of Integrated Performance Assessment Program (IPAP) inspections discussed in the Reactor Inspection activity.

The NRC conducts incident response activities to ensure that it is prepared to carry out its role in a radiological emergency at NRC-licensed nuclear reactors, that licensee responses are consistent with their responsibilities, and that NRC responses are coordinated with other Federal response activities and State and local government activities. During FY 1997, the NRC will (1) maintain and implement the NRC incident program in response to actual operational events within the industry; (2) operate the NRC Operations Center 24 hours a day with reactor systems engineers capable of receiving event reports and recognizing and communicating problems and emergencies to management; (3) coordinate efforts to improve the functionality of the Federal Radiological Emergency Response Plan, the Federal Response Plan, and agreements between the NRC and other State, Federal, and international organizations and countries on responses to nuclear events; (4) conduct a State Outreach Program to improve the States' understanding of how the NRC, as the Lead Federal Agency

(LFA), will manage the Federal response to a severe accident at a nuclear facility; (5) maintain the NRC Operations Center and regional functional procedures, response tools, and training; (6) evaluate and assess headquarters and regional incident response programs; (7) participate in the Continuity of Government Program; (8) participate in full-scale licensee and State emergency preparedness exercises with each region; and (9) provide the operational support and contract management necessary for agency response activities.

A standardized training program on the technical and organizational aspects of emergency response has been developed and continues to evolve. During FY 1997, the NRC will continue to maintain and improve standard procedures and technical tools and train NRC staff at headquarters and in the regions and staff from other Federal agencies that support the NRC during response activities. The NRC will also continue to maintain the facilities, resources, and communications equipment necessary to support the NRC's response needs, participate in full-scale licensee and State emergency preparedness exercises with each region; and coordinate the preparation and distribution of "International Nuclear Event Scale" reports. In addition, the NRC will exercise the primary responsibility for changes, interpretations, and development of immediate notification requirements.

During FY 1997, the NRC will continue to oversee power reactor operational experience. The NRC will review nuclear power reactor licensee event reports (LERs), NRC inspection reports, and U.S. industry reports. The NRC will also screen foreign reactor reports for applicability to the U.S. nuclear program. On the basis of this comprehensive and systematic review of both U.S. and foreign event data sources, significant operating events having either plant-specific or generic safety issues are identified and selected for further indepth evaluation. The evaluation assesses the root causes of the identified deficiency, the safety significance and generic implications of the deficiency, and the adequacy of corrective actions implemented and/or planned. Indepth technical evaluations of selected components, systems, system interactions, and human performance will be performed and the NRC will continue to issue case studies, trends and patterns reports, engineering evaluations, and technical reviews. Results, findings, and recommendations to prevent recurrence will be widely disseminated to the staff, the nuclear industry, and the public in a timely manner. The recommendations from these studies are formally tracked, and their status is periodically reported to the Commission. In addition, reactor events that are considered to be significant from the standpoint of public health and safety will be reported to the Commission with recommendations that they be considered as "abnormal occurrences." On an annual basis, abnormal occurrences will be reported to the Congress and the public.

The NRC will continue to emphasize investigating root causes, the contribution of human factors, and the determination of the risk significance of operational events. By emphasizing the underlying causes of significant operating events and the practices that can limit their likelihood, the lessons of experience can be more effectively communicated to the nuclear power plant industry to improve plant safety. Quantification of the risk significance of events during power operation and reactor

shutdown will be enhanced by the implementation of methods developed by the Office of Nuclear Regulatory Research. The effectiveness of NRC and industry actions to resolve safety concerns will be examined through the evaluation and trending of operational experience data. This will also help ensure that lessons learned from operating experience are not lost. Accident sequence precursor analyses will be used to evaluate potentially risk-significant events when practicable. As appropriate, actions will be initiated to resolve pertinent safety issues.

During FY 1997, the NRC will continue collecting, screening, and coding approximately 1500 commercial power reactor LERs each year into databases for agency access. The NRC will maintain its operational and reliability data storage and retrieval systems in a cost effective manner. Information from LERs, which are required by NRC regulation (10 CFR 50.73, "Licensee Event Report System"), will continue to be used for the analysis of safety significant trends. The data from LERs are coded and entered into data bases to capture the sequence of events, the failures that occurred, the causes of the events, and corrective actions to avoid similar events in the future. The NRC will maintain and streamline, where practical, the current system for processing LER data. The NRC will also streamline, where practical, its capability to code and retrieve human-performance, common-cause, and precursor data. The staff will implement the rule to obtain safety system availability and reliability data to support risk-informed, performance-based regulatory applications and to enhance maintenance rule implementation. The staff will initiate rulemaking to improve reporting of human performance, common-cause failure, and precursor data. While information about important events will continue to be required to be reported, changes to reporting requirements are intended to eliminate events of little safety significance.

The NRC will continue to coordinate safety analysis activities with other organizations, such as EPRI, INPO, and owners groups, and to provide results to those organizations as appropriate. Component failure data from the Nuclear Plant Reliability Data System (NPRDS), a database voluntarily supported by the U.S. nuclear power industry and maintained by INPO, will continue to be used to support analyses of component and system failures to determine their risk significance. The NPRDS provides component failure data that is complementary to LER data. However, it has limitations in its capability to support reliability and probabilistic safety analysis types of activities.

During the past several years, the NRC has been developing a reliability- and risk-informed approach to analyzing LER and NPRDS data. Insights from probabilistic risk assessments are used to identify components, systems, accident initiators, and safety issues which can be analyzed to assess reliability risk trends. Where available, actual operating experience is used to assess equipment performance. The NRC is planning to combine the results of this activity with the Accident Sequence Precursor program to better identify risk-significant trends in the U.S. nuclear industry.

The NRC will continue to analyze and evaluate component and system reliability. Also during this period, the staff will begin to provide risk and reliability analyses of plant performance utilizing agency and industry databases.

The NRC will also prepare trend information on component and system performance, initiating event frequencies, and human performance to monitor risk implications of changes in industry performance. This includes assessing the most risk-significant precursors to severe accident sequences. Periodically, the NRC will provide trend data associated with selected safety issues to identify changing safety trends and the effectiveness of regulatory initiatives.

The NRC conducts activities to identify, as early as practicable, individual nuclear power plants, or groups of plants, whose performance may warrant special (either increased or decreased) regulatory attention. Performance indicators are intended to provide information concerning trends in nuclear power plant performance and to assist NRC management in identifying plants for more detailed review. In FY 1997, the NRC's performance indicators will be simplified as they undergo conversion to more risk-informed indicators. System reliability analysis results, common cause failure data, and initiating events will be used to supplement the indicators. Reports showing trends in performance and comparisons with appropriate industry averages for each licensed nuclear power plant and each individual indicator will be provided to NRC senior management to support senior management meetings. Annual reports are disseminated to NRC management, the Commission, and licensees, and are available to the public. The NRC will continue to pursue performance indicator improvements for timely assessment of safety performance.

The NRC will also continue to provide information about foreign events to U.S. organizations and to report U.S. experience to foreign organizations through the Nuclear Energy Agency and the International Atomic Energy Agency's incident reporting system and through bilateral agreements. Attention will continue to be focused on the feedback of operating experience so that the lessons of experience can be used to prevent serious nuclear incidents in the future. Additionally, nuclear power plant events classified at the alert level or higher will be reported via the International Nuclear Event Scale (INES). The limited U.S. participation in this information sharing system is anticipated to continue during FY 1997.

The Committee to Review Generic Requirements reviews generic requirements for power reactors and considers the feasibility of backfitting new requirements, as applicable. During FY 1997, this committee will continue to provide agency-wide review and recommendations to the Executive Director for Operations regarding approval or disapproval of proposed changes to generic requirements and staff positions applicable to power reactors with the objectives of reducing or eliminating any unnecessary burdens placed on licensees, reducing the exposure of workers to radiation in implementing some requirements, and conserving NRC resources while ensuring adequate

protection for public health and safety and furthering the review of new, cost-effective requirements and positions.

Technical Training and Qualification

This activity provides technical training for formal NRC staff qualification in support of the reactor program. The NRC will continue to maintain the Technical Training Center (TTC) facility and manage the technical training program for NRC staff. Curriculum areas in support of the reactor program will be maintained in reactor technology, probabilistic risk assessment, engineering support, radiation protection, security and safeguards, and regulatory skills. New courses will be developed and existing courses will be modified to meet new or changing needs Training will also be provided to other Federal, State, and foreign regulatory counterpart employees on a space-available basis.

A spectrum of reactor technology training will be provided for the General Electric, Westinghouse, Combustion Engineering, and Babcock and Wilcox reactor designs to meet the highest priority agency needs, including an integrated series of classroom and simulator courses for NRC staff. Specialized technical training will be provided to meet continuing and reactive training needs.

The reactor technology training curriculum will continue to include approximately 45 courses ranging in duration from 4 days to 3 weeks. Initial reactor technology training and refresher training will be provided each year to NRC inspectors, reactor operator license examiners, and other staff in formal qualification programs. In addition, technical training will be provided to NRC technical managers. Training of headquarters and regional reactor inspectors, operator license examiners, and response staff on vendor-specific emergency operating procedures will continue during FY 1997. Major curriculum adjustments to best satisfy the highest priority regional and program office training needs will continue during FY 1997.

The Technical Training Center (TTC) will continue to respond to reactive training needs in reactor technology as identified by agency management through forums such as the training focus groups, division director counterpart meetings, and senior management meetings. During FY 1997, the NRC will provide technical training to support special staff development programs. During this period, necessary technical training will be provided in specialized areas to supplement the initial training provided to inspectors of a particular category. This training provides selected inspectors with specific expertise in areas for which all inspectors do not require the expertise.

The NRC will develop and implement new and expanded technical training in areas identified by program offices and regions. This includes new training courses to support the agency-wide Probabilistic Risk Assessment (PRA) implementation plan and new training determined to be

necessary by technical training needs surveys. In addition, reactor concepts training will be provided for employee orientation.

During FY 1997, training materials for courses in reactor technology will be maintained and improved and course examination question banks and new course modules will be developed to support operational feedback on the agency's current technical issues. The NRC will continue to maintain full-scope training simulators at the TTC to support NRC initial qualification and refresher programs. This includes maintaining the operability, reliability, and performance of the simulator hardware and software and maintaining and updating the infrastructure for simulation equipment. Performance of NRC full-scope simulators, particularly in the thermal hydraulic, reactor core, and containment response areas, will continue to be updated to the extent practical to meet NRC reactor technology training needs. This will include replacing older simulation models to improve performance and make the models transportable to other simulation platforms.

The NRC will continue development of workstation-based simulation to show parameters, system responses, and scenarios in a classroom setting. This effort, which enhances NRC understanding of complex events, involves the use of advanced simulation codes and establishment of a simulation platform capable of providing high-fidelity simulation of multiple light-water reactor designs to meet NRC reactor technology training needs. During FY 1997, the NRC will continue to develop TTC reactor technology instructors through completion and maintenance of formal qualification status in two reactor technology areas. This includes completion of initial qualification and maintenance of qualification through formal classroom training and current knowledge of events, technical issues, and operational feedback.

Investigations, Enforcement, and Legal Advice

The NRC Office of Investigations investigates allegations of wrongdoing by NRC reactor licensees; the NRC Office of Enforcement manages the agency's enforcement program, using enforcement actions as a deterrent to emphasize the importance of compliance with requirements and to encourage prompt identification and prompt, comprehensive correction of violations; and the NRC Office of the General Counsel provides legal assistance (including representation in all associated administrative and judicial proceedings and rulemaking activities) on all matters affecting NRC reactor licensees.

All findings and conclusions that result from investigations are sent to the appropriate program office and the Office of Enforcement for review of the issues involved and a determination as to whether enforcement action is warranted. The Director, Office of Investigations, refers suspected or alleged criminal violations concerning NRC licensees and others within the NRC's regulatory jurisdiction to the U.S. Department of Justice.

REACTOR PROGRAM: Reactor Regulation

The NRC will continue to investigate allegations of wrongdoing by NRC reactor licensees and others within its regulatory jurisdiction. The current workload consists of approximately 110 active reactor cases. Approximately 150-170 reactor cases are expected to be opened during FY 1997. The NRC will continue to refine, administer, and maintain quality control standards for investigations. During FY 1997, the staff will continue to apprise the Commission and appropriate agency offices of matters under investigation that may affect the public health and safety or other aspects of the agency's mission. The staff will maintain liaison with other agencies and organizations to ensure the timely exchange of information of mutual interest and refer matters judged to be criminal to the U.S. Department of Justice.

The NRC will continue to implement an enforcement program with support from the regional offices. Activities include overseeing and evaluating regional enforcement efforts; coordinating and developing regional enforcement actions and recommendations; evaluating potential enforcement cases; reviewing inspection and investigation reports and confirmatory action letters; initiating and processing notices of violations, civil monetary penalties, and various enforcement orders; reviewing draft regulations, inspection guidance, and other initiatives for their effect on the enforcement process and providing advice and guidance on related enforcement issues; providing assistance to the Office of Nuclear Reactor Regulation on orders modifying licenses; and assisting the Office of the General Counsel in the administrative hearing process, including presenting testimony.

The NRC expects to consider between 120 and 150 reactor enforcement actions during FY 1997. As the number and types of enforcement actions taken in any period of time are a function of the number of licensees and the licensees' performance, it is difficult to predict future activity levels. However, previous enforcement activity has been as follows:

Reactor Enforcement

Fiscal Year	Actions Considered	Resulting Civil Penalties	Orders Issued
1993	111	45	0
1994	129	42	6
1995	158	22	6

The Office of Enforcement will continue to develop and promulgate enforcement policy, including the maintenance of an enforcement manual. The enforcement manual was last revised in November 1995, as a result of changes to the enforcement program approved by the Commission in June 1995. Additional sections and refinements based on experience will be promulgated in

subsequent years. The staff will continue to review Commission directives for impact on the enforcement policy or program and make changes as necessary. Through FY 1997, the NRC will continue to monitor actions filed with the U.S. Department of Labor (DOL) under Section 211 of the Energy Reorganization Act, coordinate with DOL, and develop enforcement actions where there are properly supported findings of discrimination. Also during this period, the staff will maintain data generated in the enforcement process to monitor the enforcement program and to evaluate reactor licensees to identify weak performers who require greater NRC oversight.

The Office of the General Counsel (OGC) will continue to provide legal assistance to the NRC staff with respect to the staff review related to licensing, construction, operation, enforcement and decommissioning of nuclear facilities, as well as the conduct of investigations, promulgation and amendment of NRC regulations and guides pertinent to the aforementioned matters. The OGC will represent the NRC staff in adjudications arising from proposed licensing and enforcement actions; represent the Commission in lawsuits arising from adjudicatory and rulemaking decisions relating to reactors; and provide legal analyses of regulations, statutes, and cases relevant to NRC activities.

Independent Review

The Atomic Safety and Licensing Board Panel is a statutory office of the NRC and is comprised of administrative judges who, sitting alone and in three-member boards, conduct adjudicatory hearings pursuant to a number of statutes including the Administrative Procedure Act; the Atomic Energy Act of 1954, as amended; the National Environmental Policy Act of 1969, as amended; and the Program Fraud Civil Remedies Act.

The Licensing Panel's boards and judges hear and decide requests to grant, suspend, revoke, or amend licenses to construct and operate nuclear power plants and preside over rulemaking hearings. Hearings address issues involving health, safety, the environment, enforcement, civil penalties, anti-trust, and emergency planning.

During FY 1997, Licensing Panel judges and boards will conduct adjudicatory hearings, usually at or near the site where the dispute arose. Issues to be addressed will include whether to grant, suspend, revoke, or amend licenses to operate nuclear power plants, the decommissioning of nuclear power plants, and the conduct of other licensed activities. The Licensing Panel will maintain and train a legal and technical staff adequate to ensure the continuing availability of due process in its cases. The Licensing Panel will provide advice on adjudicatory matters, other proceedings, and on other regulatory and administrative matters as requested; and will review and make suggestions for amending regulations to expedite the hearing process and make it more understandable and easier to use, consistent with the recommendations of the Administrative Conference of the United States.

REACTOR PROGRAM: Reactor Regulation

The Advisory Committee on Reactor Safeguards (ACRS) has statutory responsibilities as described in the Atomic Energy Act of 1954, as amended. The ACRS performs independent reviews of and provides advice to the Commission on the licensing and operation of production and utilization facilities and related safety issues. The ACRS relies on highly qualified Members, specialized consultants, and a cadre of technical and administrative support personnel.

During FY 1997, the ACRS will review NRC regulatory activities associated with operating nuclear power plants and standard plant designs as well as the adequacy of the standard plant designs to ensure that the public health and safety are protected. The ACRS will review specific regulatory issues referred to it by the Commission. In addition, the ACRS on its own initiative will review generic matters and nuclear safety-related items.

The ACRS will continue to review selected reports of augmented inspection teams, incident investigation teams, and special inspection teams related to significant operating events as well as lessons learned from the investigation of such events. As appropriate, the ACRS will review the resolution of issues that lead to extended plant shutdowns and the basis for the NRC plant restart authorizations. The ACRS will also review domestic and foreign operating experience to ensure that the NRC is adequately addressing related safety issues.

The ACRS will review the identification, prioritization, and resolution of generic safety issues. The ACRS will also review NRC action plans for the resolution of significant safety issues (e.g., thermo-lag fire barrier issues), proposed rulemaking, and generic communication and compliance activities. The ACRS will review new safety-related regulations, policy matters, and regulatory guidance; as well as revisions to existing regulations and regulatory guidance, licensee amendment requests for power upgrades at boiling water reactors, selected NRC staff evaluation of generic topical reports, graded quality assurance programs, and the implementation of the maintenance rule. The ACRS will review proposed program changes in the administration of operator licensing examinations.

The ACRS will review implementation of the Commission's Safety Goal Policy and matters related to the use of probabilistic risk assessment (PRA) in the regulatory decision-making process. The ACRS will review risk-informed, performance-based regulations, Standard Review Plan revisions, and PRA engineering models, and the implementation of risk-informed technical specifications. The ACRS will review the extent to which the results of Individual Plant Examinations (IPEs) and Individual Plant Examinations of External Events (IPEEEs) can be used in the regulatory process. The ACRS will review the adequacy of the resolution of any generic safety issues identified in the IPE and IPEEE Programs including the associated insight reports. The ACRS will review the Performance Indicators and Accident Sequence Precursor Programs and the staff's assessment of the results of these programs. The ACRS will also review the development of proposed performance-based rules for fire protection and for steam generator tube maintenance and surveillance.

REACTOR PROGRAM: Reactor Regulation

The ACRS will review issues related to license renewal including rulemaking, regulatory guides, Standard Review Plan revisions, and staff evaluations of licensee and owners' group generic programs. In addition, the ACRS will review issues associated with predicting, detecting, and evaluating age-related degradation of plant systems, structures, and components; embrittlement and annealing of reactor pressure vessels; and determining the reliability of systems, components, and human-machine interfaces.

The ACRS will review the materials and metallurgical issues related to crack formation in reactor vessel heads, steam generator tubes, reactor vessel internals, and primary coolant pressure boundary components. The ACRS will review the NRC regulatory position on fatigue design of metal components for license renewal and on the staff evaluation of the 1994 American Society of Mechanical Engineers Code Addenda on piping design. The ACRS will also review any revised reactor pressure vessel integrity requirements resulting from the updated materials database.

The ACRS will review safety and reliability issues associated with the use of computers and digital instrumentation and control (I&C) technology in nuclear power plant safety systems. The ACRS will review the Phase 2 report by the National Academy of Sciences/National Research Council (NAS/NRC), which includes the evaluation of hardware, software, and human-machine interfaces. The ACRS will also review regulatory guidance related to the use of digital I&C for current and future plants.

The ACRS will review programs and regulatory guidance associated with the implementation of the Commission's Severe Accident Policy. The ACRS will review the use of severe accident computer codes, proposed accident management strategies, and the use of the revised source term for operating and future plants.

The ACRS will continue to review the NRC programs associated with thermal hydraulic codes. The ACRS will review issues related to the behavior of high-burnup fuel under accident conditions in current and future plants.

The ACRS will review selected elements of the NRC research programs, including those in the areas of severe accidents, thermal hydraulic modeling, fire modeling, human and organizational factors, crack initiation and growth, age-related degradation, nondestructive examination techniques, environmental stressors (digital I&C), and PRA methodology. The review will include comparison of the NRC programs to foreign and domestic research programs.

The ACRS will review decommissioning issues, as needed, and onsite dry cask storage at production and utilization facilities. The ACRS will review the ongoing and planned NRC and industry activities associated with motor-operated valve (MOV) reliability; resolution of the issues associated with thermo-lag fire barrier qualification; and amendments to security regulations associated with insider

threat, fitness-for-duty, and onsite storage of spent fuel. The ACRS will review selected issues from the Human Performance Program Plan and regulatory issues related to organizational and human factors. The ACRS will continue to review selected NRC Technical Training Center training programs to address emerging curriculum needs such as digital I&C and PRA. The ACRS will review the regulatory reform initiatives and the activities being performed as part of the National Performance Review Phase II.

General Support

This activity encompasses efforts to supervise and coordinate the policy development and operational activities of the Reactor Regulation Cost Center. It also includes all information technology-related efforts for the Offices of Nuclear Reactor Regulation and Nuclear Regulatory Research in support of power reactor regulation.

Standard Reactor Designs Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	14,438	10,793	7,969	-2,824
Contract Support	22,240	8,808	6,073	-2,735
Travel	414	325	380	55
Total	37,092	19,926	14,422	-5,504
Budget Authority by Activity ($K)				
Standard Reactor Design Certification	19,616	10,292	7,416	-2,876
Standard Reactor Safety Assessment	14,677	7,247	5,127	-2,120
Legal Advice	84	88	92	4
Independent Review	1,069	1,111	1,118	7
General Support	1,646	1,188	669	-519
Total	37,092	19,926	14,422	-5,504
Full-Time Equivalent Employment by Activity				
Standard Reactor Design Certification	126	83	61	-22
Standard Reactor Safety Assessment	19	14	7	-7
Legal Advice	1	1	1	0
Independent Review	10	10	10	0
General Support	13	13	7	-6
Total	169	121	86	-35

This cost center supports licensing activities associated with standard reactor designs; ensures that certified standard reactor designs, when properly sited and constructed, will adequately protect the public health and safety and the environment; and ensures that the combination of industry and NRC research provides the technical bases for timely and sound rulemaking and regulatory decisions to support NRC design certification activities. NRC's standard reactor design efforts include technical

reviews and independent experiments on safety system performance conducted as part of the programmatic activities of the offices of Nuclear Reactor Regulation and Nuclear Regulatory Research, independent reviews by the Advisory Committee on Reactor Safeguards, and legal advice and adjudicatory activities by the Office of the General Counsel and the Atomic Safety and Licensing Board Panel, respectively.

This cost center includes five major activities: standard reactor design certification; standard reactor safety assessment; legal advice; independent review; and general support.

Standard Reactor Design Certification

The standardization of nuclear power plant designs can increase the safety, reliability, and availability of nuclear power plants. Standardization will allow for a more thorough understanding of the designs by the NRC and a more efficient review process. Therefore, the Commission has strongly endorsed regulatory actions that will encourage industry to pursue standardization. The NRC will continue to review the passive reactor designs, to resolve safety issues (including generic safety issues identified on currently operating reactors), and to develop and implement applicable rules, policies and guidance for the certification of standard designs.

The NRC completed its technical reviews for two evolutionary light-water reactor designs (the General Electric (GE) Advanced Boiling-Water Reactor (ABWR) and the ASEA Brown Boveri/Combustion Engineering (ABB/CE) System 80+) and issued final design approvals for these two designs in July 1994. The NRC began the rulemaking process required for design certification and expects to certify both evolutionary designs in FY 1996.

Through FY 1997, the NRC expects to continue its detailed technical review of the Westinghouse advanced passive pressurized water reactor design (AP600). The staff's review efforts will emphasize resolving concerns on testing and codes. The NRC will continue its collaboration with the Italian Regulatory Agency, ANPA, whereby ANPA will assist NRC in the review of specific areas regarding the AP600: the observation and analysis of thermal-hydraulic experiments run by WEC in Italy, severe accident analysis, PRA success paths and independent PRA analyses, the effect of thermal-hydraulic unreliability on PRA analysis, and review of the protection and safety monitoring system. The NRC expects to issue a supplement to the Draft Safety Evaluation Report on testing and codes in FY 1996. Review effort associated with the remainder of the items associated with the Final Design Approval is expected to be completed in FY 1997.

Through FY 1997, the NRC will continue to develop policy and guidance for reliability assurance programs for next-generation reactors. The policy will consider reliability goals for systems and equipment, including passive components, design measures, and testing and monitoring requirements.

In addition, the NRC will work with the industry to develop and publish guidance for vendors and utilities.

Standard Reactor Safety Assessment

This activity includes (1) research to develop independent assessment methods, analytical models, and verified data needed to support design certification safety reviews and related rulemakings for advanced reactors, and (2) efforts to establish regulations and regulatory guidance for the combined license process described in 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

The NRC will identify concerns of potential safety significance for selected safety systems, review the applicant's experimental and analytical programs, and develop independent information for making timely regulatory judgments. Working closely with the applicant, the NRC will provide feedback regarding the development and execution of the applicant's programs and will avoid unwarranted duplication of safety research efforts. At the same time, the vendor-generated analytical and experimental information will be independently verified as necessary, especially in areas in which the applicant would be the sole source of information.

Through FY 1997, RES will continue to assist NRR in the review of the AP600 reactor design to identify and resolve key safety issues. The results of research in the standard reactor safety assessment activity will be used to assess the adequacy of new advanced reactor design concepts and investigate the margins of safety in structural, electrical, and mechanical components which are needed to support design certification and licensing decisions. Analyses and experiments will be performed to characterize safety system response to transients and postulated accidents. Results from vendors' test programs for the AP600 will be reviewed to determine whether identified safety concerns have been satisfactorily resolved through these programs and to assess the RELAP5 Code. These efforts will be completed in time to support design certification under 10 CFR Part 52. Confirmatory work in this area will continue in FY 1997 to complete validation of the analytical tools used in the certification review.

During FY 1996, results obtained from experiments at the ROSA-V and Oregon State University (AP-600) test facilities, as well as those experiments performed by the industry will identify any additional confirmatory testing needed to be performed in FY 1997.

In the area of severe accident analysis, the NRC will assimilate results and insights from LWR severe accident research to assess the behavior of the AP600 plant under accident conditions. In particular, the NRC will assess the applicability of the accident phenomena modeled in existing severe accident codes to these new designs (viz., passive, gravity-driven safety systems). Research information

needed to support design certification, in accordance with established schedules, will be provided. Limited confirmatory research will continue in this area in FY 1997, if required.

In FY 1997, the NRC will update siting and source term and regulatory guides to reflect the results of new LWR source-term research, as necessary.

During FY 1997, the NRC will continue to work with national standards-setting organizations to ensure that the existing engineering and material standards are applicable for the advanced reactor designs. New standards will be developed if needed.

Legal Advice

The Office of the General Counsel (OGC) will address legal questions related to design certification and will represent the staff in any related administrative proceedings or judicial challenges.

Independent Review

During FY 1997, the Atomic Safety and Licensing Board Panel (ASLBP) will continue to provide advice on adjudicatory and dispute resolution matters related to new standard reactor designs and will preside over standard reactor design hearings.

The Advisory Committee on Reactor Safeguards (ACRS) will review technical and policy issues related to the licensing of evolutionary and passive plant designs. This activity includes issues identified by the NRC staff as well as those identified independently by the ACRS. The ACRS will review the design certification rulemaking for the ABWR and System 80+ designs, the design certification of the AP600, and test and analysis programs being conducted by Westinghouse as well as the confirmatory test program being conducted by the NRC, to support certification of the AP600 designs. The ACRS will also review policy and implementation issues associated with the use of design acceptance criteria; inspections, tests, analyses, and acceptance criteria for new standard plant designs; regulatory guides needed to implement the 10 CFR Part 52 regulation; severe accident rulemaking for standard plant designs; analyses and methodology used to support licensing positions for standard plant design applications (e.g., thermal-hydraulic code analyses); proposed resolution of safety-related issues for passive plant designs; and security and protection requirements against sabotage for future plant designs.

REACTOR PROGRAM: Standard Reactor Designs

General Support

This activity encompasses efforts to supervise and coordinate the policy development and operational activities of the Standard Reactor Designs Cost Center. It also includes information technology efforts of NRR to maintain the Construction Inspection Program database management system that will enable the NRC to ensure adequate coverage of construction activities for reactor designs.

Test and Research Reactors Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	1,219	1,730	1,806	76
Contract Support	345	295	280	-15
Travel	106	124	104	-20
Total	1,670	2,149	2,190	41
Full-Time Equivalent Employment (FTE)	15	20	20	0

The Test and Research Reactors Cost Center is conducted to ensure the safe operation of test and research reactors not used to generate power on a commercial basis and referred to as nonpower reactors. These smaller reactors are designed and used for research and testing in areas such as physics, chemistry, biology, medicine, and materials sciences; and for training of individuals for nuclear-related careers in the power industry, national defense, research, and education. NRC's Office of Nuclear Reactor Regulation conducts all agency activities associated with the licensing, inspection, oversight, and decommissioning of these reactors, and with the examination and requalification of nonpower reactor operators.

The NRC reviews new and renewal license applications and license amendments for nonpower reactors to evaluate the safety, environmental, and safeguards aspects of their operation. From past experience, the NRC expects to receive as many as 2 applications for license renewal and approximately 30 other license amendments each year. The NRC also conducts inspections at approximately 40 nonpower reactors each year to ensure their safe operation.

In addition to licensing and inspecting the nonpower facilities, the NRC must also license all personnel authorized to operate the nonpower reactors. The NRC administers initial examinations for new reactor operators and either inspects licensee requalification programs or conducts individual requalification examinations "for cause" to ensure that the approximately 300 nonpower reactor operators are qualified to perform their duties.

Through FY 1997, the NRC will continue to implement its regulation (10 CFR 50.64, "Limitations on the Use of Highly Enriched Uranium (HEO) in Domestic Non-Power Reactors") requiring

domestic nonpower reactors to convert from highly enriched uranium to low-enriched uranium. Of the remaining 12 reactors affected, it is expected that approximately 8 will convert over the next 10 years.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM

(Dollar amounts in tables represent thousands of dollars ($K). In text, whole dollar amounts are used. Staff numbers represent full-time equivalents (FTEs).)

Total FY 1997 Estimate $83,310,000

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	48,394	49,860	52,834	2,974
Contract Support	36,053	22,665	27,853	5,188
Travel	3,325	2,679	2,623	-56
Total	87,772	75,204	83,310	8,106
Budget Authority by Cost Center ($K)				
Fuel Facilities	11,094	11,137	15,045	3,908
Materials Users	27,480	29,330	30,565	1,235
Low-Level Waste and Decommissioning	19,832	16,770	16,425	-345
Other Nuclear Materials and Waste Activities	7,366	6,967	7,275	308
High-Level Waste	22,000	11,000	14,000	3,000
Total	87,772	75,204	83,310	8,106
Full-Time Equivalent Employment by Cost Center				
Fuel Facilities	107	108	121	13
Materials Users	237	258	249	-9
Low-Level Waste and Decommissioning	121	115	116	1
Other Nuclear Materials and Waste Activities	69	67	68	1
High-Level Waste	59	43	43	0
Total	593	591	597	6

EXPLANATION OF RESOURCE CHANGES

Fuel Facilities

The resource increase in FY 1997 is due primarily to NRC's interaction with the Department of Energy on their proposed high-level radioactive waste solidification system at Hanford, Washington. Resources also increase for efforts associated with the preparation and review of a license application for the design, construction, and operation of an Atomic Vapor Laser Isotope Separation (AVLIS) module at a uranium enrichment facility.

Materials Users

The resource increase in FY 1997 is to begin preparation of an environmental impact statement and safety analysis report for an application submitted for a privately-owned independent spent fuel storage installation. Resources also increase due to an increase in dual purpose (transportation and interim storage) spent fuel cask applications from industry since DOE does not anticipate proceeding with the multi-purpose canister beyond the design phase. This increase is partially offset by a decrease which reflects the completion of the prototype detailed design of the new redesigned materials licensing process and implementation of initial portions of this process.

Low-Level Waste and Decommissioning

The resource decrease in FY 1997 reflects completion of the reviews of terminated license files and completion of guidance on low-level waste (LLW) performance assessment.

Other Nuclear Materials and Waste Activities

The resource increase in FY 1997 is due primarily to increased costs for salaries and benefits.

High-Level Waste

The resource increase in FY 1997 will allow NRC to keep pace with the DOE program, address key technical issues, and maintain the Center for Nuclear Waste Regulatory Analyses (CNWRA). NRC will provide feedback to DOE on resolving the key technical issues that are most important for DOE to consider in developing its viability assessment. The CNWRA will continue to provide independent technical expertise that is essential to the high-level waste management program.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM

DESCRIPTION OF PROGRAM

The Nuclear Materials and Nuclear Waste Program encompasses all NRC public health and safety, safeguards, research activities, operational data analysis, technical training, adjudicatory reviews, investigations, enforcement, and independent safety and legal advice related to the licensing, inspection, and environmental reviews for fuel cycle facilities; the transportation of nuclear materials; the safe interim storage of spent fuel; nuclear materials users; the safe management and disposal of low-level and high-level radioactive wastes; and uranium recovery and related remedial actions. This program also includes interaction with the Department of Energy on their proposed high-level radioactive waste solidification system at Hanford, Washington, safeguards reviews for all licensing activities involving the export of special nuclear material, and the integrated agency effort to oversee decontamination and decommissioning of facilities and sites associated with NRC-licensed activities.

This program comprises five cost centers: Fuel Facilities; Materials Users; Low-Level Waste and Decommissioning; Other Nuclear Materials and Waste Activities; and High-Level Waste.

The funds and staff for each of the five cost centers are described on pages 83 through 114. The contract support funds are allocated for work done by DOE contractors and commercial contractors for the NRC. The material that follows describes these cost centers and addresses the reasons why the resources are needed.

Fuel Facilities Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	8,562	9,058	10,620	1,562
Contract Support	1,998	1,598	4,015	2,417
Travel	534	481	410	-71
Total	11,094	11,137	15,045	3,908
Budget Authority by Activity ($K)				
Fuel Fabricators Oversight and Inspections	7,214	7,563	10,979	3,416
Uranium Enrichment Oversight and Inspections	2,323	2,016	2,559	543
General Support	1,557	1,558	1,507	-51
Total	11,094	11,137	15,045	3,908
Full-Time Equivalent Employment by Activity				
Fuel Fabricators Oversight and Inspections	68	72	85	13
Uranium Enrichment Oversight and Inspections	22	18	19	1
General Support	17	18	17	-1
Total	107	108	121	13

This cost center ensures that licensees adequately protect the public health and safety, common defense and security, worker safety, and the environment when radioactive material is handled and used for the nuclear fuel cycle after milling. Efforts in this cost center comprise NRC licensing, inspection, and regulatory oversight and development for the conversion of uranium ore concentrates (yellowcake) into uranium hexafluoride before enrichment, enrichment, the development and fabrication of reactor fuel, and the safe storage of fresh reactor fuel at reactor sites until the reactor core is initially loaded with fuel. Within the framework of this cost center, the NRC staff performs regulatory oversight of the United States Enrichment Corporation's (USEC's) operation of the two gaseous diffusion enrichment plants (Paducah and Portsmouth), and USEC's security program to protect classified matter at these plants. This cost center also includes NRC's interaction with the

Department of Energy on their proposed high-level radioactive waste solidification system at Hanford, Washington.

This cost center comprises three major activities: fuel fabricators oversight and inspections; uranium enrichment oversight and inspections; and general support.

Fuel Fabricators Oversight and Inspections

This activity comprises NRC licensing, inspection, and regulatory oversight of the fuel cycle after milling; it requires detailed health, safety, safeguards, and environmental reviews and inspections of licensee procedures and facilities to ensure safe operations.

The NRC will complete the review and evaluation of approximately 80 license applications (new, amendment, and renewal) for nuclear fuel cycle facilities in FY 1997. The NRC will also complete approximately 35 evaluations of new and amended safeguards plans for these facilities. Routinely scheduled health, safety, and safeguards inspections of approximately 25 fuel cycle facilities or sites will be conducted in FY 1997 to provide reasonable assurance that unsafe conditions, involving unnecessary and harmful radiation exposure to employees or the public, do not develop and that radioactive materials are properly controlled to prevent a nuclear criticality accident. This activity also includes reviews for waste processing at DOE sites. The NRC directs its safeguards inspections by ensuring that licensees comply with NRC requirements pertaining to, for example, protected area access control; detection, annunciation, and communications systems; barriers; material control and accounting systems; process monitoring systems; contingency plans for responding to threatening situations; and trained armed response personnel.

In FY 1997, the NRC will continue to upgrade the fuel cycle facility program by evaluating changes to the regulatory base for 10 CFR Part 70 in order to continue to increase the confidence in safety at these facilities. It will also refine the inspection procedures for evaluating nuclear criticality and chemical safety and continue a training program for staff and licensees to strengthen the program.

In FY 1997, the NRC will interact with the Department of Energy on their proposed High-Level Radioactive Waste Solidification System at Hanford, Washington. During FY 1996, DOE initiated efforts for design of a pilot-scale facility to demonstrate technologies for immobilizing highly radioactive tank waste from the Hanford site. NRC's interaction is necessary to allow NRC to prepare for the eventual licensing of DOE contractors' facilities which is expected in the early 2000's. During FY 1997, NRC will begin development of an overall review strategy which will be available as guidance for DOE's contractors.

Uranium Enrichment Oversight and Inspections

This activity comprises the certification and regulatory oversight of the two USEC facilities, and the licensing activities for the Louisiana Energy Services (LES) centrifuge uranium enrichment facility, including maintenance of the LES license in anticipation of a decision by LES to initiate construction of the facility. This activity also includes the oversight activities associated with the licensing of an AVLIS module at a uranium enrichment facility and includes the administration of a classified enrichment technology security program to provide guidance on and ensure proper protection of classified material.

In FY 1996, USEC submitted the initial application for a certificate of compliance with the new NRC standards that were promulgated in September 1994. In FY 1996, the NRC will complete the first certification review for the plants and will issue the first annual report to Congress on whether these plants are operating in compliance with NRC's standards. During FY 1996-1997, the NRC will ensure that USEC operation of the gaseous diffusion enrichment plants provides adequate protection of the public health and safety and the common defense and security. NRC resident inspectors will continually inspect these two plants and will focus on operational safety, followup of events, quality management and staff performance.

Also during FY 1996-1997, the NRC will prepare for and review a license application for the design, construction and operation of an AVLIS module at a uranium enrichment facility. USEC expects to submit an application for AVLIS in December 1996.

In FY 1997, the NRC will also provide security policy and classification guidance support for the protection of national security information and restricted data for licensing, certifying, or regulating uranium enrichment facilities such as LES and USEC.

General Support

This activity comprises NRC supervision and coordination of policy direction efforts and operational activities of the Fuel Facilities Cost Center.

Materials Users Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	18,764	21,492	21,679	187
Contract Support	7,233	6,674	7,592	918
Travel	1,483	1,164	1,294	130
Total	27,480	29,330	30,565	1,235
Budget Authority by Activity ($K)				
Transportation and Spent Fuel Storage Licensing and Inspection	4,109	6,370	8,117	1,747
Licensing and Inspecting Nuclear Materials Users	14,331	14,874	14,296	-578
Nuclear Materials Research and Regulation Development	4,769	4,200	4,405	205
General Support	4,271	3,886	3,747	-139
Total	27,480	29,330	30,565	1,235
Full-Time Equivalent Employment by Activity				
Transportation and Spent Fuel Storage Licensing and Inspection	31	53	53	0
Licensing and Inspecting Nuclear Materials Users	142	141	137	-4
Nuclear Materials Research and Regulation Development	21	20	20	0
General Support	43	44	39	-5
Total	237	258	249	-9

This cost center ensures that licensees adequately protect the public health and safety, worker safety, and the environment when radioactive material is transported and used in various situations under normal operations and abnormal events. Efforts in this cost center comprise NRC licensing,

inspection, and regulatory oversight and development for the transportation of radioactive materials in packages that produce a high degree of safety and for the safe use of radioactive material.

This cost center comprises four major activities: transportation and spent fuel storage licensing and inspection; licensing and inspecting nuclear materials users; nuclear materials research and regulation development; and general support.

Transportation and Spent Fuel Storage Licensing and Inspection

This activity comprises NRC certification of transport container package designs; licensing, inspection, and regulatory oversight of the interim storage of spent fuel outside reactor sites; and the safe interim storage of spent fuel. This activity ensures that licensees transport nuclear materials in packages that will provide a high degree of safety, and that licensees provide safe interim storage of spent reactor fuel. The NRC transportation activities are closely coordinated with those of the Department of Transportation and, as appropriate, with DOE and the Federal Emergency Management Agency (FEMA). The spent fuel storage activities require detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities to ensure safe operations.

The NRC will complete the review of approximately 80 container design applications (new, amendment, and renewal) in FY 1997. These applications are submitted by commercial vendors for transport of large quantities of radioactive material. Of these 80 applications, approximately 5 to 10 applications are expected for major spent fuel casks, most of which will be dual purpose (transportation and interim storage) casks. In addition, in FY 1997, the NRC will inspect approximately 10 implementations of quality assurance programs by users, suppliers, and fabricators of NRC-certified transport packages and will inspect some dry storage and materials vendors.

The NRC will complete the review of approximately 15 transport safeguards plans for shipments of special nuclear material in FY 1997. The NRC will also survey routes proposed for shipments of nuclear material and relay to the Department of Transportation notifications received from licensees and carriers of planned import, export, or domestic shipments of nuclear material.

The DOE system for inventory and forecast of spent fuel and high-level radioactive waste generation will be monitored closely to enable timely and adequate waste management and early warning of capacity problems. The NRC will continue to maintain awareness of any potential delays in the DOE waste disposal program. In FY 1997, the NRC will inspect spent-fuel storage facilities and perform onsite inspections of concrete vaults and casks at reactors. The NRC will also review 10 applications for new licenses, topical reports, and license amendments for site-specific interim storage of spent fuel at reactors.

In FY 1996, the NRC will conduct prelicensing activities with industry in preparation for receipt of an application for a privately-owned independent spent-fuel storage installation. The NRC will initiate review of the application in FY 1997.

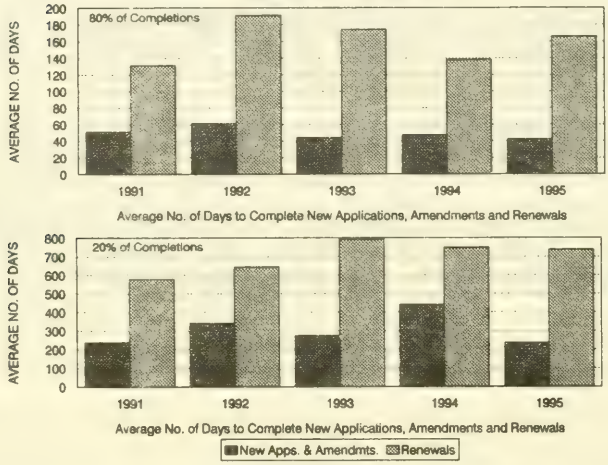
Licensing and Inspecting Nuclear Materials Users

This activity comprises NRC licensing and inspection of approximately 6,600 medical, academic, industrial, and commercial users of nuclear and other radioactive material. These uses include medical diagnosis and therapy, medical and biological research, academic training and research, industrial gauging and nondestructive testing, production of radiopharmaceuticals, and fabrication of such commercial products as smoke detectors and other sealed sources and devices. Detailed health and safety reviews and inspections of licensee procedures and facilities provide reasonable assurance of safe operations and the development of safe products.

During FY 1995, the NRC completed approximately 4,200 licensing actions for materials users which comprised about 290 new licenses, 2,880 amendments to licenses, and 1,050 license renewals. In FY 1997, the NRC will complete the review of approximately 3,800 applications for new licenses, license amendments, license renewals, and sealed source and device designs for the use of radioactive material. The NRC will also conduct preapproval tests of new sealed sources and devices and technologies and test any products in which generic problems may occur. In FY 1997, the NRC will evaluate current regulations concerning generally and specifically licensed devices.

NRC's timeliness goal is to complete 80 percent of new applications and license amendments for byproduct materials licenses within 90 calendar days of their receipt, and the remainder within 180 calendar days. The goal for renewal applications is to complete 80 percent within 180 calendar days and the remainder within 1 year. Backlogged reviews are those reviews that exceed the timeliness goal. For reviews completed during each of the last 5 years, the following chart shows the average time required to complete new, amendment, and renewal licenses for byproduct materials.

Figure 5
MATERIALS LICENSING REVIEWS
Timeliness of Reviews Completed Each Fiscal Year

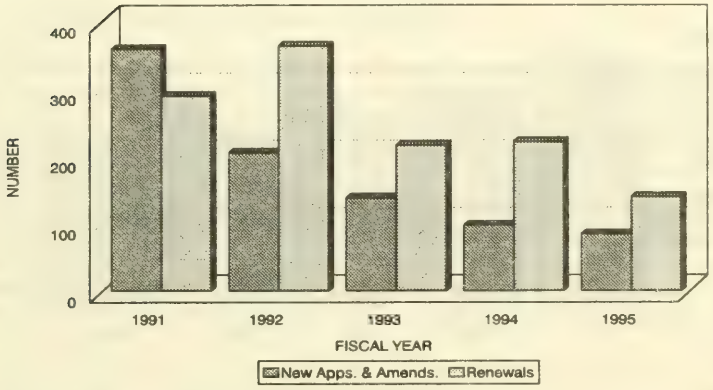


Also during FY 1995, the number of pending licensing actions was reduced from 1,560 to 1,445. Of these licensing actions, 223 were backlogged at the end of FY 1995. This reflects about a 30 percent decrease in backlogged actions.

The materials licensing reviews backlog chart shown below presents a different perspective on NRC's timeliness in processing licensing actions. It measures the number of actions to be completed at the end of each fiscal year that exceed the timeliness goals. This chart shows that significant reductions have been made in the number of backlogged reviews, particularly license renewals, in the past 3 years. This is consistent with the increases shown in the materials licensing reviews timeliness chart,

with each reflecting the completion of many previously backlogged old reviews. (As the old inventory is cleared out, the backlog drops, but the average time to complete reviews rises.)

Figure 6
MATERIALS LICENSING REVIEWS
Backlog

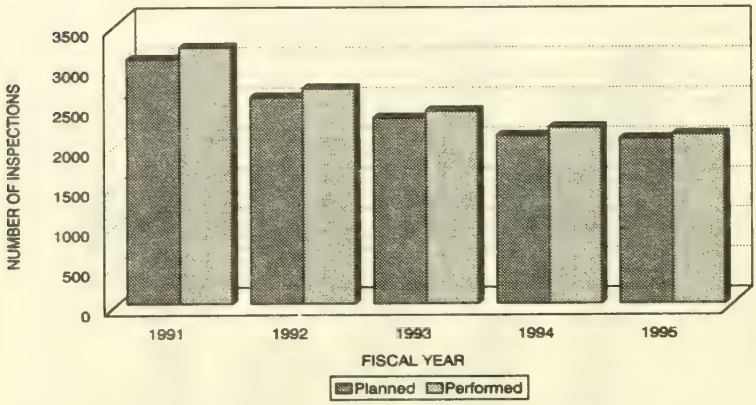


The 1991 100-percent fee recovery rule took place in the 5-year period and had significant impact on the average number of days to complete reviews. This rule brought about an unexpectedly high number of requests from licenses to terminate licenses and to combine licenses in order to reduce their fees. These license amendment requests were far more than originally forecast. This resulted in an increase in the average number of days to complete reviews in FY 1991-1995 and an accumulation of backlogged licensing work (see materials licensing reviews backlog chart), particularly in FY 1991 and FY 1992.

In FY 1997, the NRC will continue to update and implement the medical management plan to provide programmatic improvements in the medical area for licensing, inspection guidance, and rulemaking, and conduct other analyses and evaluations as needed. The National Academy of Sciences (NAS) recently completed its independent indepth review of regulatory rules, policies, practices, and procedures to assess whether NRC's current framework for medical use of byproduct material is appropriate to fulfill statutory responsibilities to protect the public health and safety. During FY 1996-1997, the NRC will review NAS recommendations and take appropriate action.

As shown in the following chart, the NRC completed about 2,100 inspections of materials facilities in FY 1995. Over the last 5 years, there has been a decline in the number of materials licensees; therefore, fewer materials inspections are planned and performed.

Figure 7
MATERIALS INSPECTIONS



The NRC will conduct approximately 1,900 routine health and safety inspections and closeout inspections of materials licensees in FY 1997. These inspections are designed to ensure that licensees are conducting operations in a safe manner and in accordance with procedures and regulations. If conditions are noted that could cause unnecessary exposures or releases, prompt and appropriate enforcement actions are taken.

In FY 1997, the NRC will implement the Integrated Materials Performance Evaluation Program to assess the performance of NRC's regional materials program and that of the Agreement States.

In FY 1996, the NRC will continue its analysis for streamlining the materials licensing and inspection work process. The objective of this analysis is to use work process engineering to establish more efficient and potentially automated processing of material license and amendment requests and use similar methods to improve on the materials inspection process. In FY 1997, the NRC will initiate implementation of the results of the streamlining analysis and modify, as needed, the new licensing

process so as to assess potential effects on Agreement States and to anticipate and mitigate any potential effect on public health and safety.

In FY 1997, the NRC will complete the review and evaluation of international safeguards and physical security aspects of approximately 110 license applications for the export of nuclear material from the United States and 30 Executive Branch consultation cases

Nuclear Materials Research and Regulation Development

This activity comprises NRC efforts associated with developing regulations, policy statements, and regulatory guides needed for the safeguarding of facilities and special nuclear materials, for the transportation of radioactive materials, and for the safe medical, academic, and industrial use of radioactive materials; and developing the technical basis for radiation protection standards for ensuring that exposure of workers and the public to ionizing radiation from licensed nuclear materials activities is kept as low as is reasonably achievable. Safeguards regulatory products ensure the physical security and accountability of strategic special nuclear material and the physical protection of licensed facilities. Medical, academic, and industrial regulatory products help to ensure the public safety in the use of radioisotopes in medical diagnosis and the therapy, medical and biological research, academic training and research, industrial gauging and nondestructive testing, radiopharmaceutical production, and fabrication of such consumer products as smoke detectors.

The development of materials rules and regulatory guidance is managed centrally in the Office of Nuclear Regulatory Research to ensure that: (1) needed rules are developed in a timely manner, (2) regulatory impact analyses are performed to assure that only materials-related rulemaking that are cost beneficial go forward, and (3) the results of NRC and other research are incorporated in materials regulations, policy statements, and guides for use in the licensing process. Semiannually, the NRC performs an integrated review of the priorities and schedules for all rulemaking actions to ensure that the highest priority rulemaking efforts are conducted and that rulemaking actions having the highest priority are initiated, beginning with a cost-benefit assessment, as final rules are completed. In addition, the NRC will continue to seek ways of providing earlier and more substantial involvement of Agreement States in the development of rulemakings and other regulatory efforts that affect those activities that are licensed by NRC in non-Agreement States and by the State authorities in Agreement States, e.g., activities licensed under 10 CFR Parts 30, 40, 61, and 70.

During FY 1996-1997, the NRC will conduct ten rulemaking actions applicable to materials licensees and issue proposed or final rules, perform the associated regulatory impact analyses (RIAs), and develop the associated regulatory guides where applicable for the following: (1) safeguards for spent nuclear fuel or high-level waste, 10 CFR Parts 60, 72, 73, 75; (2) list of approved spent fuel storage casks: revision of VSC-24 storage cask, 10 CFR Part 72; (3) revision of reciprocity provisions for

Agreement State licensees in areas of exclusive Federal jurisdiction, 10 CFR Part 150; (4) provision to establish the pregnancy/breast-feeding status of patients prior to administration of radioactive materials or radiation, 10 CFR Part 35; (5) provide general license to permit any physician to administer exempt quantities of radioactive material as part of medical diagnosis, 10 CFR Part 35; (6) material control and accounting, Parts 70, 74; (7) alternative criteria for non-profit entities and alternative criteria for non-bond issuing licensees, Parts 30, 40, 50, 70, 72; (8) resolution of dual regulations of airborne emissions, 10 CFR Part 20; (9) clarification of criteria for uranium mills and tailings, 10 CFR Part 40; and (10) provide flexibility for the form of tritium light sources which may be used in timepieces exempt from licensing, 10 CFR Part 32.

During FY 1996-1997, the NRC will continue to work on rules identified by the National Performance Review as candidates for revision or elimination. The NRC will continue to implement changes in these and other existing materials regulations and regulatory requirements that have a large economic impact but that can be eliminated or modified without significantly reducing safety. The NRC will evaluate the recommendations by the National Academy of Sciences for modification of NRC regulatory framework for radiation medicine. Regulation changes will be needed to implement fully revisions to streamline and simplify the materials license application process.

This activity also includes research on materials radiation protection and health effects that is being conducted to ensure that workers and the general public are adequately protected from the adverse consequences of exposure to ionizing radiation from licensed materials activities. Efforts include developing nuclear materials radiation protection standards and guidelines for implementing the standards in the licensing process.

In FY 1997, the NRC will develop performance criteria to implement testing and accreditation criteria for extremity dosimetry. The NRC will also monitor ongoing health effects research and operating experience and develop appropriate materials-related regulations or regulatory guidance to address needs identified on the basis of this information.

General Support

This activity comprises NRC supervision and coordination of policy direction efforts, and operational activities of the Materials Users Cost Center.

Low-Level Waste and Decommissioning Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	9,856	9,796	10,312	516
Contract Support	9,372	6,505	5,685	-820
Travel	604	469	428	-41
Total	19,832	16,770	16,425	-345
Budget Authority by Activity ($K)				
Low-Level Waste Oversight and Inspections	4,588	1,407	976	-431
Decommissioning	11,094	10,954	10,991	37
Uranium Recovery	1,963	1,763	1,639	-124
General Support	2,187	2,646	2,819	173
Total	19,832	16,770	16,425	-345
Full-Time Equivalent Employment by Activity				
Low-Level Waste Oversight and Inspections	17	9	8	-1
Decommissioning	58	65	68	3
Uranium Recovery	21	17	15	-2
General Support	25	24	25	1
Total	121	115	116	1

This cost center ensures the effective and efficient discharge of NRC responsibilities to regulate low-level waste (LLW) in order to adequately protect the public health and safety and ensures an integrated agency program to oversee decontamination and decommissioning of facilities and sites associated with NRC licensed activities. Functions in this cost center are mandated by the Low-Level Radioactive Waste Policy Act (LLRWPA) of 1980, the Low-Level Radioactive Waste Policy Amendments Act (LLRWPAA) of 1985, the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, and portions of the West Valley Demonstration Project Act of 1980.

The LLRWPA makes each State responsible for providing for the disposal of LLW generated within its borders. This may result in up to 12 new LLW disposal facilities as States develop facilities and form compacts to dispose of waste. The LLRWPAA gives the NRC responsibility for defining LLW, licensing the Federal disposal of commercial LLW that is greater than Class C (Class C waste is defined in 10 CFR Part 61), granting individual generators of waste emergency access to non-Federal disposal facilities, providing regulatory guidance on alternatives to conventional shallow land burial, and ensuring that its reviews of LLW disposal facility applications are completed to the extent practicable within 15 months after formal receipt, excluding the hearing process.

The UMTRCA directs the NRC to develop regulations and to license the disposal of mill tailings from licensed uranium mills. Congress also directed the NRC to amend its regulations to conform to the Environmental Protection Agency (EPA) standards for these wastes. The UMTRCA directs the NRC to approve licensee plans for disposing of mill tailings, to review and concur in the site-by-site implementation of the Department of Energy (DOE) program for remedial actions concerning mill tailings, and to license DOE possession and long-term care of these sites.

This cost center includes NRC's regulatory program for the decommissioning of materials sites, including NRC activities for the timely decommissioning of contaminated sites listed in the Site Decommissioning Management Plan (SDMP) and for the resolution of technical and policy issues to facilitate timely decommissioning of sites. Research to address issues concerning radionuclide transport and behavior in the environment is also included in this cost center to provide generic support for licensing actions, especially decontamination, where the movement of radioactive contaminants through the near surface environment is a concern. NRC activities to interact with the Environmental Protection Agency (EPA) to resolve issues of mutual concern related to the regulation of radionuclides in the environment to avoid unnecessary duplication of regulatory requirements are also included in this cost center.

This cost center comprises four major activities: low-level waste oversight and inspections; decommissioning; uranium recovery; and general support.

Low-Level Waste Oversight and Inspections

This activity comprises NRC licensing, inspection, and regulatory development efforts for those facilities under its jurisdiction that are engaged in near-surface land disposal. Regulatory responsibilities are implemented through detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities to ensure safe operations. Resolution of low-level waste (LLW) disposal issues on waste form stability, waste package integrity, radionuclide transport through the disposal facility environment, and long-term doses resulting from radionuclide releases

beyond the disposal facility environment is needed to ensure the long-term protection of the public health and safety and the environment.

In FY 1997, the NRC will complete guidance on conducting LLW site performance assessments, and guidance that provides safe alternatives for disposal of contaminated emission control dust.

In FY 1997, the NRC will complete the review and evaluation of the Special Nuclear Material (SNM) license renewal application for the Hanford LLW disposal facility, conduct inspections of the SNM licenses at Hanford and Barnwell, and evaluate licensee effectiveness in processing, packaging and shipping LLW at nuclear power reactors.

In FY 1997, the NRC will maintain the existing LLW performance assessment modeling capability for timely completion of reviews as mandated by the LLRWPAA by developing, conducting, and evaluating performance assessments in order to prepare to respond to the submittal of a LLW facility application from a non-Agreement State.

In FY 1997, the NRC will conduct the inspection program at waste generator facilities and at operating and developing LLW disposal facilities. This program will address construction and operation of disposal facilities and radiation protection and environmental surveillance.

The Advisory Committee on Nuclear Waste (ACNW) provides the Commission with independent technical review of and advice on the disposal of low-level nuclear waste and related matters. To perform objective reviews and provide advice, the ACNW relies on highly qualified members and specialized consultants, as well as highly qualified technical support staff. The ACNW also reviews and provides advice on nuclear waste disposal facilities within the purview of NRC responsibilities, as directed by the Commission.

The ACNW activities in the area of low-level nuclear waste primarily focus on disposal facility issues associated with the Nuclear Waste Policy Act, the Low-Level Radioactive Waste Policy Act, and the Uranium Mill Tailings Radiation Control Act. During FY 1997, the ACNW will: review the Office of Nuclear Regulatory Research programs supporting the Office of Nuclear Material Safety and Safeguards Waste Management Division, technical issues associated with the environmental transport of radioactive materials; the environmental monitoring of low-level radioactive waste disposal facilities; international programs; and strategies for lessons applicable to domestic LLW disposal. The ACNW will also review: progress in the development of NRC's LLW performance assessment capabilities and attendant guidance to assist licensees and Agreement States; progress underway at site decommissioning management plan sites; and developing radiological criterion for decommissioning. When requested by the Commission, the ACNW will review reactor

decommissioning projects; staff activities associated with the adequacy and compatibility of Agreement States programs; and other studies and activities as directed by the Commission.

Decommissioning

This activity comprises NRC's integrated requirements for the decontamination and decommissioning of facilities and sites associated with NRC-licensed activities. Decommissioning involves safely removing a facility from service and reducing residual radioactivity to a level that permits the property to be released for unrestricted use. This action is to be taken by a licensee before termination of the license. In some cases, non-licensed facilities may also be required to reduce or stabilize contamination prior to release of sites. This activity also includes decommissioning and environmental protection research being conducted to develop and coordinate radiation protection standards and guidelines for the decommissioning of facilities and sites associated with NRC-licensed activities and radionuclide transport and behavior research being conducted to provide a technical basis for evaluating radionuclide movement from contaminated sites to the environment. The research findings will be used to establish criteria for releasing areas containing radioactive material and to evaluate potential pathways and doses and risks from public exposure to radioactive material.

In FY 1997, the NRC will continue to manage a program for materials facility decommissioning to review submittals resulting from the Decommissioning Rule. It will also review approximately 50 financial assurance certifications and funding plans each year as a part of new, amendment, and renewal license requests.

In FY 1997, the NRC will review a license termination plan and prepare the safety evaluation report, the environmental assessment, and the license termination order for a shutdown, defueled nuclear power reactor.

During FY 1996-1997, the NRC will conduct licensing reviews, including emergency preparedness and radiation protection inspections, at five power reactors in a safe storage condition that do not have spent fuel on-site.

During FY 1996-1997, the NRC will conduct actions necessary to encourage timely cleanup of approximately 50 known materials and fuel facility sites listed in the site decommissioning management program (SDMP). This program includes: (1) review and approval of the decontamination and decommissioning plans; (2) review of the licensees' performance of decommissioning activities; (3) conduct of confirmatory surveys and termination of licenses; (4) review of earlier burials of radioactive material under 10 CFR 20.302 and 20.304; (5) development of policy and regulations to ensure efficient and consistent licensing actions to

minimize future contaminated sites problems; and (6) implementation of an action plan to encourage and enforce timely cleanup of sites listed in the SDMP.

During FY 1996-1997, the NRC will adopt a graded approach for conducting confirmatory surveys at licensed materials facilities in support of decommissioning. In conjunction with this revised approach, NRC will develop protocols for decommissioning which will include the graded approach for conducting confirmatory surveys.

In FY 1997, NRC will develop and maintain an inspection program and inspection procedures for decommissioning of SDMP sites, and routine and non-routine materials facilities.

In FY 1997, the NRC will continue to interact with the Environmental Protection Agency (EPA) to resolve issues of mutual concern that relate to the regulation of radionuclides in the environment to avoid unnecessary duplication of regulatory requirements. These issues include harmonization of risk goals and assessment methods, decommissioning criteria, effluent limits, waste management activities, standards for disposal of LLW, and standards for recycling.

In FY 1997, the NRC will complete a mechanistic assessment of soil geochemistry in controlling radionuclide transport. Particular attention will be given to surface effects on silicate minerals.

In FY 1997, the NRC will conduct large-scale field experiments to assess flow and transport in heterogeneous media. This builds on earlier work at Las Cruces, New Mexico, to assess the present capability of modeling groundwater flow and radionuclide transport in the unsaturated zone. This work will be used to evaluate monitoring strategies, methods, and instrumentation.

In FY 1997, the NRC will complete the adaptation of the LLW Performance Assessment Methodology for use in site decommissioning. Also in FY 1997, a test of the methodology will be completed using a site from the Site Decommissioning Management Plant (SDMP).

Beginning in FY 1997, a field study will be conducted to assess alternative techniques for monitoring moisture movement and contaminant transport in the unsaturated zone. Field data will be collected over a range of field scales to develop technical bases for reviewing monitoring programs associated with decommissioning activities.

In FY 1997, the NRC will adapt the infiltration and transport analysis methods developed for LLW (NUREG/CR-6346) to SDMP reviews.

In FY 1997, the NRC will continue work on radionuclide solubilities which are important to determining movement of radionuclides in the environment.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM
Low-Level Waste and Decommissioning

During FY 1996-1997, the NRC is planning to conduct six rulemaking actions applicable to decommissioning and environmental protection, and issue proposed and/or final rules and the associated regulatory guides where applicable for the following: (1) sewer disposal, 10 CFR Part 20; (2) nuclear power reactor decommissioning cost requirements, 10 CFR Part 50; (3) clarification of decommissioning funding certification requirements, 10 CFR Parts 30, 40, 50, 70, 72; (4) enhanced participatory rulemaking (EPR) on criteria for reuse-recycle, 10 CFR Part 20 (after completion of present rulemaking "Radiological Criteria for Decommissioning of Nuclear Facilities"); (5) nuclear power reactor decommissioning financial assurance implementation requirements, 10 CFR Part 50; and (6)revised insurance and emergency preparedness requirements for permanently shutdown power reactors, 10 CFR Parts 50 and 140.

Semiannually, the NRC performs an integrated review of the priorities and schedules for all rulemaking actions to ensure that the highest priority rulemaking efforts are conducted and that rulemaking actions having the highest priority are initiated as final rules are completed.

In FY 1997, the NRC will conduct: (1) a systematic assessment of the existing exemptions allowing release of radioactive material from regulatory control, (2) research on potential doses from the recycling or reuse of contaminated materials and equipment, and (3) investigations on the appropriateness of criteria for releasing areas containing buried radioactive materials (regulatory guidance will be developed as necessary). Among the regulatory guides the NRC will publish are: (1) Post Shutdown Decommissioning Activities Report, (2) Reactor Decommissioning Process, and (3) Standard Format and Content for Licensee Termination Plans.

In FY 1997, the NRC will continue implementation efforts directed at decommissioning activities. The NRC will issue guidance that will define the doses that would result from surface and volumetric levels of radioactive contamination should facilities and lands be released for unrestricted public use. Calculational models to be incorporated into the dose modeling strategy will encompass a range of site and source inventory complexities for groundwater flow and transport, and air deposition and resuspension processes (including coupling and appropriate calculational codes for dose assessment). The NRC will enhance and test the calculational models against specific site conditions and residual contamination inventories on a variety of site and inventory data sets through the facility scale, and assess associated uncertainties. In FY 1997, the NRC will reexamine the validity of the criteria and certification amounts based on actual decommissioning costs for nonpower reactor facilities.

In FY 1997, the NRC will closely coordinate regulatory research with other Federal organizations. For example, the NRC will participate in EPA's interagency task group to prepare Federal guidance on exposure of the public to radiation. One action assigned to this task group is the development of Federal guidance on radiological criteria for decommissioning.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM
Low-Level Waste and Decommissioning

Uranium Recovery

This activity comprises NRC licensing and inspection of uranium mills, heap-leaching facilities, ore-buying stations, commercial solution mining, uranium extraction research and development projects, and commercial disposal of radioactive tailings or waste as defined in Section 11e (2) of the Atomic Energy Act of 1954, as amended. This activity requires detailed health, safety, and environmental reviews and inspections of licensee procedures and facilities to provide reasonable assurance of safe operations; the development of NRC regulatory guidance to implement the EPA standards for regulating mill tailings; and the site-by-site approval of licensee plans for disposing of mill tailings and other radioactive material.

The NRC will complete the review of two licensee reclamation plans in FY 1997, including preparation of environmental impact statements for selected uranium recovery sites.

The NRC will complete the review of approximately 40 new, amendment, and renewal license applications for uranium recovery facilities in FY 1997 and begin the review of one construction completion report and one long-term surveillance plan, both of which must be approved prior to termination of a site-specific license. The NRC will also conduct approximately 35 radiological safety inspections and inspections of uranium reclamation activities in FY 1997. During these inspections, the NRC will thoroughly review each licensee's program and implementation of licensee conditions to protect the public health and safety and the environment.

This activity also includes NRC's efforts related to the evaluation of the remedial actions to be taken by DOE at 24 mill tailings piles at 22 sites, as well as at several thousand contaminated properties located near the sites. The NRC reviews and concurs in remedial action plans and proposed designs for the site and properties in the vicinity of the site and concurs in DOE's plans for long-term control of radiation or radioactive and nonradioactive releases from the site and for the protection and cleanup of groundwater. Once the remedial action has been completed, the NRC is responsible for licensing DOE for long-term care and site maintenance.

The NRC has already concurred in remedial action plans for 15 of the 22 sites. The DOE Uranium Mill Tailings Remedial Action Project is currently scheduled to terminate by the end of FY 1996. DOE has requested an extension from Congress to 1998 to complete remedial actions at the remaining sites. NRC has assumed the project will be extended. Therefore, in FY 1997, the NRC will continue to review and concur in DOE's proposed remedial action plans and related documents. The NRC will also continue to concur in completed remedial actions and long-term surveillance plans for all the sites.

General Support

This activity comprises NRC supervision and coordination of policy direction efforts, and operational activities of the Low-Level Waste and Decommissioning Cost Center.

In FY 1997, the NRC will operate and enhance the Advanced Computer System (ACS). The ACS is a computer network consisting of approximately five client/servers, 20 Unix workstations, 30 personal computers, and associated peripheral equipment. This system will assist the NRC staff in the review of applicant site characterization activities and engineered facilities, and performance assessments for licensing decisions. The NRC will continue to procure and install proprietary software for the ACS, such as advanced scientific visualization software, complex natural system modeling programs, and sophisticated engineering design calculations.

Other Nuclear Materials and Waste Activities Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	5,838	5,934	6,278	344
Contract Support	1,212	724	724	0
Travel	316	309	273	-36
Total	7,366	6,967	7,275	308
Budget Authority by Activity ($K)				
Independent Analysis of Operational Experience	1,076	1,129	1,165	36
Technical Training and Qualification	1,054	617	625	8
Adjudicatory Reviews	150	104	108	4
Investigations, Enforcement, and Legal Advice	3,654	3,672	3,773	101
Event Evaluation	1,432	1,445	1,604	159
Total	7,366	6,967	7,275	308
Full-Time Equivalent Employment by Activity				
Independent Analysis of Operational Experience	9	9	9	0
Technical Training and Qualifications	2	2	2	0
Adjudicatory Reviews	1	1	1	0
Investigations, Enforcement and Legal Advice	39	38	38	0
Event Evaluation	18	17	18	1
Total	69	67	68	1

This cost center ensures identification, evaluation and response to potentially significant events and safety concerns, technical training, independent adjudicatory reviews, investigations of wrongdoing

by licensees, enforcement policy, and resolution of legal issues associated with nuclear materials licensees.

This cost center comprises five major activities: independent analysis of operational experience; technical training and qualification; adjudicatory reviews; investigations, enforcement, and legal advice; and event evaluation.

Independent Analysis of Operational Experience

This activity is conducted by the Office for Analysis and Evaluation of Operational Data (AEOD) to identify, evaluate, and respond to potentially significant events and safety concerns involving nonreactor facilities, based on events reported to the NRC by its licensees and the Agreement States.

AEOD oversees the agency's incident and accident investigation programs to ensure that significant and extraordinary safety-significant operational events involving nuclear materials and fuel facilities licensed by the NRC are investigated in a systematic and technically sound manner and that information is obtained on the causes of the events, including those involving NRC activities, so that the NRC can take corrective actions that are timely and effective. For events that could be of major significance, an accident review group (ARG) or incident investigation team (IIT) is established that is independent of the region and the program office. For investigating less significant operational events, an Augmented Inspection Team is established, under regional direction complemented by headquarters personnel, as necessary. In FY 1997, the NRC will support IITs as required; maintain the Incident Investigation Program Management Directive, associated manual, and IIT rosters, and incorporate the lessons learned from completed IITs; and conduct periodic training of IIT roster members and leaders. The NRC will also independently review the adequacy of the resolution of staff actions assigned by the Executive Director for Operations (EDO) for IITs and document the status until closeout of IIT-initiated staff actions. In FY 1997, the NRC will implement and maintain the programmatic actions needed to ensure the capability to activate and support an ARG reporting to the Commission in response to an event of extraordinary safety significance at a licensed nuclear materials facility.

The NRC conducts incident response activities to ensure that it is prepared to carry out its role in a radiological emergency at NRC-licensed nonreactor facilities, that licensee responses are consistent with their responsibilities, and that NRC responses are coordinated with other Federal response activities and State and local government activities.

In FY 1997, the NRC will (1) maintain and implement the NRC incident response program in response to actual operational events within the industry especially as they relate to gaseous diffusion

plants; (2) operate the NRC Operations Center 24 hours a day with nuclear engineers capable of receiving event reports and recognizing and communicating problems and emergencies to management; (3) coordinate State and Federal response efforts to develop and improve the Federal Radiological Emergency Response Plan and the Federal Response Plan; and (4) maintain the NRC Operations Center and regional functional procedures, response tools, and training. In FY 1997, the NRC will assess regional incident response programs and emergency preparedness exercises with each region.

A standardized training program on the technical and organizational aspects of emergency response has been developed and continues to evolve. In FY 1997, this training will continue to be conducted for headquarters and regional response personnel. Training will also be offered periodically to Federal agencies that support the NRC, as well as State agencies that the NRC supports during an accident. At least one exercise will be conducted annually to confirm and maintain the capabilities of NRC response personnel to meet the unique needs associated with materials licensees and fuel cycle facilities. More efficient notification and information exchange methods will continue to be developed among the Federal response agencies involved in this area.

This activity also includes the review and evaluation of operational experience from NRC licensees and Agreement States to identify generic issues resulting from significant events or situations that warrant detailed evaluation. These issues are further analyzed to assess the root causes of the identified deficiency and the adequacy of corrective actions implemented and planned, and to identify those safety concerns that may warrant regulatory attention. Operational events, such as overexposure to radioactive materials and medical misadministrations of nuclear material, are included in this review.

In FY 1997, the NRC will continue to issue studies, trends and patterns reports, engineering evaluations, and nuclear materials technical reviews. Results, findings, and recommendations for actions based on these studies will be widely disseminated to the appropriate entities and the public in a timely manner. The NRC will continue the collection, technical screening, and coding of nuclear materials events into the Nuclear Materials Events database for both agency and Agreement State access. The NRC will maintain a client/server application to provide the capability for the database to be accessed throughout the NRC.

Technical Training and Qualification

This activity provides technical training for NRC staff in support of the nuclear materials and nuclear waste program. Curriculum areas in support of the nuclear materials and nuclear waste program will be maintained in probabilistic risk assessment, radiation protection, fuel cycle technology, security

and safeguards, and regulatory skills. New courses will be developed and existing courses will be modified to meet new or changing needs. Training is made available to Agreement State inspectors. Training is also provided to other Federal, State, and foreign regulatory counterpart employees on a space-available basis.

The technical training curriculum will continue to be provided to ensure appropriate coverage in specialized areas. In FY 1997, the technical training curriculum supporting the nuclear materials and nuclear waste program will continue to include approximately 60 courses ranging in duration from 1 day to 5 weeks. Emphasis will continue to be placed on nuclear materials safety and fuel cycle program development and training.

Adjudicatory Reviews

The Atomic Safety and Licensing Board Panel is a statutory office of the NRC comprised of administrative judges who, sitting alone and in three-member boards, conduct adjudicatory hearings pursuant to a number of statutes including: the Administrative Procedure Act; the Atomic Energy Act of 1954, as amended; the National Environmental Policy Act of 1969, as amended; the Nuclear Waste Policy Act of 1982, as amended; and the Program Fraud Civil Remedies Act. In FY 1997, the Atomic Safety and Licensing Board Panel will conduct adjudicatory hearings, usually at or near the site where the dispute arose, pursuant to those acts.

The Licensing Panel's boards and judges hear and decide requests to grant, suspend, revoke, or amend licenses and preside over rulemaking hearings. Hearings address issues involving health, safety, and the environment, as well as enforcement matters, antitrust, and emergency planning. Individual administrative judges and administrative law judges are authorized to decide cases involving the licensing of nuclear materials and other cases, as directed by the Commission. The Panel also will maintain and train a legal and technical staff adequate to ensure the appropriate conduct of its cases. The Panel will provide advice on adjudicatory matters, other proceedings, and regulatory and administrative matters pertaining to the adjudicatory process.

Investigations, Enforcement, and Legal Advice

The NRC Office of Investigations (OI) investigates allegations of wrongdoing by NRC materials licensees; the NRC Office of Enforcement (OE) manages the agency's enforcement program, using enforcement actions as a deterrent to emphasize the importance of compliance with requirements and to encourage prompt identification and prompt, comprehensive correction of violations; and the NRC Office of General Counsel (OGC) addresses legal questions associated with the licensing and

regulation of all material licensees, spent-fuel storage, low-level waste management, transportation of nuclear materials, and certification of the United States Enrichment Corporation's (USEC) gaseous diffusion enrichment facilities.

All findings and conclusions that result from investigations are sent to the appropriate program office and to OE for review of the issues involved and a determination as to whether enforcement action is warranted. The Director, OI, refers suspected or alleged criminal violations concerning NRC licensees and others within the NRC's regulatory jurisdiction to the U. S. Department of Justice (DOJ). The NRC will continue to investigate allegations of wrongdoing by NRC materials licensees and others within its regulatory jurisdiction. The current workload consists of approximately 30 active materials cases. Approximately 50-70 materials cases are expected to be opened during FY 1997. The NRC will continue to refine, administer, and maintain quality control standards for investigations. In FY 1997, the staff will continue to apprise the Commission and appropriate agency offices of matters under investigation that may affect the public health and safety or other aspects of the agency's mission. The staff will maintain liaison with other agencies and organizations to ensure the timely exchange of information of mutual interest and refer matters judged to be criminal to DOJ.

The NRC will continue to implement an enforcement program with support from the regional offices. Activities include overseeing and evaluating regional enforcement efforts; coordinating and developing regional enforcement actions and recommendations, evaluating potential enforcement cases; reviewing inspection and investigation reports and confirmatory action letters, initiating and processing notices of violations, civil monetary penalties, and various enforcement orders; reviewing draft regulations, inspection guidance, and other initiatives for their effect on the enforcement process and providing advice and guidance on related enforcement issues; assisting the Office of Nuclear Material Safety and Safeguards on orders modifying licenses, including cleanup orders; and assisting OGC in the administrative hearing process, including presenting testimony.

The NRC expects to consider between 120 and 150 materials enforcement actions in FY 1997. As the number and types of enforcement actions taken in any period are a function of the number of licensees and the licensees' performance, it is difficult to predict future activity levels, however, previous enforcement activity has been as follows:

Materials Enforcement

Fiscal Year	Actions Considered	Resulting Civil Penalties	Orders Issued
1993	205	74	10
1994	151	51	30
1995	124	34	21

The OE will continue to develop and promulgate enforcement policy, including the maintenance of an enforcement manual. The Enforcement Manual was last revised in November 1995, as a result of changes to the enforcement program approved by the Commission in June 1995. Additional sections and refinements based on experience will be issued in subsequent years. The staff will continue to review Commission directives for impact on the enforcement policy or program and make changes as necessary. In FY 1997, the NRC will continue to monitor actions filed with the Department of Labor (DOL) under Section 211 of the Energy Reorganization Act, coordinate with DOL, and develop enforcement actions where there are properly supported findings of discrimination. Also during this period, the staff will maintain data generated in the enforcement process to monitor the enforcement program and to evaluate materials licensees to identify weak performers who require greater NRC oversight.

The Office of the General Counsel will address legal questions related to the regulation of spent-fuel storage, low-level waste management, transportation of nuclear materials, and will provide legal assistance to the staff as the staff issues procedures and implements a regulatory framework governing NRC regulation and certification of the United States Enrichment Corporation gaseous diffusion enrichment facilities.

The OGC will provide legal assistance to the NRC staff with respect to the licensing, operation, enforcement, decommissioning, and the conduct of investigation of materials licensees and facilities, including the certification of the United States Enrichment Corporation gaseous diffusion enrichment facilities; the promulgation and amendment of NRC regulations and guides pertinent to the aforementioned matters; representing the NRC staff in adjudications arising from proposed licensing

and enforcement actions; representing the Commission in lawsuits arising from adjudicatory and rulemaking decisions related to materials licensees; and providing legal analyses of regulations, statutes, and cases relevant to NRC activities.

Event Evaluation

The Office of Nuclear Material Safety and Safeguards (NMSS) responds to incidents and events in the materials and transportation programs. In FY 1997, NMSS will maintain the capability for incident response and safety-based reactive inspections pertaining to materials and transportation. NMSS will also provide the capability for allegations, investigations, enforcement actions, and operational data analysis.

High-Level Waste Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	5,374	3,580	3,945	365
Contract Support	16,238	7,164	9,837	2,673
Travel	388	256	218	-38
Total	22,000	11,000	14,000	3,000
Budget Authority by Activity ($K)				
High-Level Waste Licensing	21,376	10,692	13,680	2,988
Other High-Level Waste Activities	624	308	320	12
Total	22,000	11,000	14,000	3,000
Full-Time Equivalent Employment by Activity				
High-Level Waste Licensing	54	40	40	0
Other High-Level Waste Activities	5	3	3	0
Total	59	43	43	0

The regulatory activities in this cost center are mandated by the Nuclear Waste Policy Act (NWPA) of 1982, the Nuclear Waste Policy Amendments Act (NWPAA) of 1987, and the National Energy Policy Act of 1992. The NWPA specifies a detailed approach for the long-range undertaking of high-level waste (HLW) disposal, with DOE having operational responsibility and the NRC having regulatory responsibility. This undertaking involves a complex, integrated system of waste handling, transportation, interim and retrievable storage, and ultimate deep geologic disposal of HLW, requiring the protection of the public health and safety and the environment over thousands of years. The NWPAA directs DOE to characterize only one candidate site, the Yucca Mountain site in the State of Nevada, and to terminate site-specific activities at all other candidate sites. The National Energy Policy Act directs the NRC to revise its regulations (10 CFR Part 60) within one year after the Environmental Protection Agency (EPA) issues new standards.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM: High-Level Waste

NRC's HLW repository program is proceeding according to the process established by the NWPA, as amended, and supports the current DOE schedule. NRC staff is reviewing DOE's activities as it implements its reduced program which focuses on synthesizing available site data while making major reductions in collecting new data. The goal of DOE's reduced program is a viability assessment of Yucca Mountain in 1999. The NRC is developing review procedures and acceptance criteria to review DOE's viability assessment from a regulatory perspective and eventually a license application. NRC also will provide feedback to DOE on resolving key technical issues most important to repository performance and licensing.

The Center for Nuclear Waste Regulatory Analyses (CNWRA), a federally funded research and development center (FFRDC) under contract to the NRC, has been established to provide technical assistance and conduct research for NRC's HLW program. The CNWRA provides support, under NRC direction, for NRC activities related to the geologic repository under the NWPA and NWPAA. The NRC will continue to sponsor the CNWRA during the planning period. This sponsorship will include providing for the administrative, management, and quality assurance procedures and practices necessary to operate the CNWRA.

The contract support funds are allocated for work done for the NRC by the CNWRA and some commercial contractors and universities.

This cost center comprises two major activities: high-level waste licensing and other high-level waste activities. Together, these activities are designed to ensure that high-level nuclear waste is managed and disposed of safely.

High-Level Waste Licensing

This activity is conducted to ensure the effective, efficient, and timely discharge of NRC's licensing responsibilities under the NWPA and NWPAA.

The high-level waste (HLW) licensing activity consists of work required to implement NRC's responsibility to license and inspect the national HLW repository. To fulfill this responsibility without causing undue delay or unnecessary rework in DOE's reduced program, the NRC and DOE will continue to interact and conduct prelicensing consultation. In the near-term, these consultations are for the purpose of resolving key technical issues that are important for DOE to consider in developing its viability assessment. Near-term consultations also will provide the basis for an effective and efficient licensing process by providing guidance to help ensure that the DOE program develops essential and acceptable data, providing onsite overview of DOE activities, and reviewing and evaluating DOE submittals. NRC prelicensing consultations, reviews and development of review procedures will be focused on resolving, at the staff level, those key technical issues most important

to repository performance and eventual licensing. This approach coordinates all NRC activities related to each key issue and focuses on evaluating a "vertical slice" of DOE activities for resolving the key issues.

In FY 1997, the NRC will continue to work cooperatively with EPA as EPA revises its HLW standards. After EPA issues a revised standard, the NRC will reinitiate and issue a proposed and final rulemaking on elimination of inconsistencies between NRC regulations (10 CFR Part 60) and EPA HLW standards. During this period, the NRC will continue to review and comment on DOE program planning documentation to help ensure that NWPA and NWPAA statutory actions are completed and the schedules are met. In addition, as required under the NWPAA, the NRC will provide limited support to the Nuclear Waste Technical Review Board.

In FY 1997, with support from the CNWRA, the staff will continue to develop the review procedures and acceptance criteria that are related to key technical issues and associated "vertical slice" reviews.

In FY 1997, for key technical issues the NRC will continue to develop and revise repository subsystem models such as: (1) models for thermohydraulics, radiolysis, and galvanic corrosion within the engineered barrier system; (2) modeling of fault displacement, volcanism, and seismic hazards; (3) thermal/thermal-mechanical modeling; and (4) modeling of other topics as needed for assessing key technical issues. The staff will use these models and codes for key technical issues to evaluate DOE's site information, to develop the review procedures and acceptance criteria to support the EPA conforming rulemaking, to provide for assumptions made in the development and application of the repository total system model, and provide information for design reviews. These models also will be used to conduct sensitivity analyses to help focus on the most important parameters or processes within an issue.

In FY 1997, the staff will continue to conduct performance assessments of the repository system on an iterative basis, incorporating improved mechanistic models and system code methodology, as appropriate for key technical issues. The process uses predictive models and codes to obtain quantitative estimates of performance based on emerging data and increased understanding of the phenomena on which the models are based. This process will continue until DOE submits a license application containing an assessment of repository system performance. These performance assessments also either confirm the significance of key technical issues or identify new issues based on overall system evaluation.

In FY 1997, the NRC will conduct a limited number of independent technical investigations to support: (1) developing the licensing tools and technical bases for the acceptance criteria and review procedures necessary to judge the adequacy of DOE's license application, and (2) ensuring sufficient independent understanding of the most significant physical processes taking place at the geologic repository. These investigations will combine theoretical study with a limited number of laboratory

and field experiments and will focus only on those key technical issues that have the greatest uncertainty and importance to repository performance. The technical issues of concern include the interaction of the waste form and container with the environment at the disposal site, the effects of geologic processes on long-term performance of the repository, the movement of radioactive material from the disposal facility to the accessible environment, and the long-term geologic stability of the Yucca Mountain site.

During FY 1997, the investigation of engineered systems will respond to technical issues in the areas of controlled release, waste package, and repository design, construction, and operation The NRC investigations will provide the support needed to address key technical issues and will provide information to models and codes used for assessing the performance of the engineered barrier system. The investigations will also address whether the short-term, small-scale tests and experiments on waste packages and other engineered components of the repository system that are performed by DOE in support of its license application are appropriate and sufficient to assess performance of engineered barrier systems within acceptable limits. They also will address the effects of the coupled interactions between the repository system components (including the host rock and groundwater) in the zone affected by waste heat, and the effects on the long-term stability of the engineered facility

Investigations in the earth science area will address topics such as volcanism, tectonics and seismology, hydrogeochemistry, groundwater flow and transport, radionuclide sorption and transport, and microbiological action on tuff.

In FY 1997, with CNWRA support, the staff will review DOE's site synthesis reports, process models, outlines, total system performance assessments, and a limited number of design and topical reports. These reviews will be limited to reports or sections of reports related to the key technical issues most important to licensing. In FY 1997, the NRC will continue onsite liaison at Yucca Mountain to facilitate direct exchange of repository-related information with DOE and the State of Nevada, and to provide quality assurance and technical oversight of data, documents, and site characterization activities related to the key technical issues.

In FY 1997, the staff will continue to sponsor and oversee the management of the CNWRA, including management support and planning, expertise development and maintenance, and internal quality assurance Also in FY 1997, the staff and the CNWRA will continue to operate, and maintain the Repository Program Database (RPD), and the staff will provide data entry services for the Technical Reference Document Database System at the CNWRA.

The NRC will continue to keep pace with DOE's generic work on central interim storage during FY 1996-1997. During FY 1996-1997, NRC will review a DOE topical safety analysis report on a dry transfer system. During FY 1997, NRC expects to review an amended DOE topical report that contains enhanced techniques for calculating burnup credit

Other High-Level Waste Activities

This activity provides the Commission with independent technical review of and advice on the management and disposal of HLW, and legal advice and assistance on high-level waste management issues.

The Advisory Committee on Nuclear Waste (ACNW) acts as a focused center of expertise for independent technical review of and advice on HLW regulatory activities. To perform objective reviews and provide advice on the issues, the ACNW relies on highly qualified members and consulting specialists. The ACNW is responsible for reviewing and providing advice on all aspects of nuclear waste disposal facilities within the purview of NRC responsibilities, as directed by the Commission. The ACNW high-level nuclear waste efforts are focused primarily on the proposed geologic repository and spent fuel storage.

In FY 1997, the ACNW expects to focus on a changing HLW regulatory framework. As a result of the recently published report by the National Research Council, "Technical Bases for Yucca Mountain Standards," the EPA will issue new high-level waste disposal standards in 40 CFR Part 197. The NRC will be required to modify or propose alternatives to the current 10 CFR Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories," to conform with new EPA HLW standards. ACNW intends to provide advice to the Commission to ensure a workable regulatory framework for high-level waste disposal that will provide adequate assurance of protecting public health and safety.

DOE has changed its focus from a site suitability decision and license application submittal to a viability assessment. The ACNW will (1) evaluate DOE's revised approach and NRC's revised program and procedures, (2) provide advice to the Commission on DOE's effort to reach a viability assessment determination for the Yucca Mountain project and its waste isolation strategy, (3) provide advice to the Commissioners and guidance to the staff on site characterization and analysis activities, and (4) review the repository design including thermal loading. Questions to be addressed include the effects of coupled processes (thermal-hydrologic-mechanical-chemical).

The ACNW will continue its review of NRC staff activities associated with the iterative performance assessment program for the proposed HLW repository, including issues associated with validation of predictive models of component behavior, development of associated guidance, the use of expert elicitation, and the usefulness of a simplified performance assessment model. The ACNW will also review the development, testing and performance predictions of the waste package and engineered barrier systems; and international programs and strategies for lessons applicable to domestic HLW disposal. As requested by the Commission, the ACNW will review plans for an interim and retrievable spent fuel storage facility. The ACNW will continue its oversight reviews of development and implementation of technical assistance support at the CNWRA and will visit the CNWRA.

NUCLEAR MATERIALS AND NUCLEAR WASTE PROGRAM: High-Level Waste

The ACNW will review NRC and DOE activities associated with the evaluation of the HLW management and disposal program from an overall systems perspective. During the planning period, the ACNW will visit the proposed Yucca Mountain HLW repository site in Nevada during development of the Exploratory Studies Facility to observe excavation procedures being used and the site characterization studies that are in progress.

The Office of the General Counsel provides legal advice and assistance relating to storage, transportation, and disposal of HLW. This includes providing legal advice and assistance relating to the development and review of NRC regulations and guides pertinent to licensing a HLW geological repository, and interim and retrievable storage facilities. It also includes representing the NRC in all evidentiary hearings on the HLW repository license application, including the review of material generated by the NRC and by contacts with persons and entities outside the NRC.

During FY 1996-1997, the Office of the General Counsel will (1) provide legal support for the development and review of NRC regulations and guides pertinent to licensing and construction of the HLW repository or any other interim storage facility and represent the NRC staff in public rulemaking activities; analyze and interpret regulations, statues, and cases relevant to NRC activities, and provide legal advice and assistance to the Commission and staff, (2) provide legal services to assist in the development of policy in conjunction with the licensing of the HLW repository or any interim Federal storage facility and provide advice and consultation to the Commission and staff on legal and policy aspects of health, safety, environmental, and safeguards issues arising from the licensing process; and (3) provide legal services to the Licensing Support System (LSS) Administrator.

The Licensing Support System Administrator will maintain a flexible posture pending congressional actions which may redirect the High Level Waste Repository program at the Department of Energy. The LSS Administration will: (1) participate in evaluating DOE's response to congressional redirection, (2) have involvement in the development of recommendations for a Commission strategy, and (3) prepare a programmatic approach for the automation of licensing activities in support of that position.

MANAGEMENT AND SUPPORT PROGRAM

MANAGEMENT AND SUPPORT PROGRAM

(Dollar amounts in tables represent thousands of dollars ($K). In text, whole dollar amounts are used Staff numbers represent full-time equivalents (FTEs).)

Total FY 1997 Estimate $154,920,000

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	57,101	59,179	60,585	1,406
Contract Support	101,986	96,891	93,001	-3,890
Travel	1,690	1,649	1,334	-315
Total	160,777	157,719	154,920	-2,799
Budget Authority by Cost Center ($K)				
Policy and Direction	17,048	17,239	17,855	616
Resource and Administration	130,915	128,291	125,949	-2,342
Special Technical Programs	12,814	12,189	11,116	-1,073
Total	160,777	157,719	154,920	-2,799
Full-Time Equivalent Employment by Cost Center				
Policy and Direction	179	177	177	0
Resource and Administration	513	512	503	-9
Special Technical Programs	95	92	86	-6
Total	787	781	766	-15

EXPLANATION OF RESOURCE CHANGES

Policy and Direction

Resource increases in FY 1997 are due to increased costs for salaries and benefits, slightly offset by decreases in travel consistent with overall agency downsizing.

MANAGEMENT AND SUPPORT PROGRAM

Resource and Administration

Resource decreases in FY 1997 primarily result from delaying information technology purchases, changing our obligation process for employee moves, and decreasing administrative and personnel support, and travel consistent with overall agency downsizing. These decreases are offset by increased costs to implement Department of Justice recomendations for improving Federal building security, relocation of Region II offices to the new Federal building, and for salaries and benefits.

Special Technical Programs

Resource decreases in FY 1997 are primarily the result of discontinuing support for Agreement States travel in conjunction with NRC training courses, and reviews of requested Department of Defense/Department of Energy (DOD/DOE) reactor projects and facilities.

DESCRIPTION OF PROGRAM

The Management and Support Program encompasses NRC central policy direction, legal advice for the Commission, analysis of long-term policy issues, administrative proceeding review and advice, liaison with outside constituents and other government agencies, financial management, all administrative and logistical support, information resources management, executive management services for the Commission, personnel and training, and matters involving small and disadvantaged businesses and civil rights. This program also includes international programs and support for Agreement States. This program comprises the following three cost centers. Policy and Direction, Resource and Administration, and Special Technical Programs.

The funds and staff for each of the three cost centers are discussed on pages 118 through 138. The contract support funds are allocated for services and products obtained from commercial contractors and other Federal agencies such as the General Services Administration and the Office of Personnel Management. The narrative that follows describes these cost centers and addresses the reasons why the resources are needed.

Policy and Direction Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	15,403	15,911	16,598	687
Contract Support	1,103	771	771	0
Travel	542	557	486	-71
Total	17,048	17,239	17,855	616
Budget Authority by Activity ($K)				
Commission	3,558	3,741	3,857	116
Commission Appellate Adjudication	545	568	579	11
Congressional Affairs	814	849	880	31
General Counsel	5,581	5,676	5,902	226
Public Affairs	1,454	1,342	1,397	55
Secretariat	2,595	2,849	2,945	96
Executive Director for Operations	2,501	2,214	2,295	81
Total	17,048	17,239	17,855	616
Full-Time Equivalent Employment by Activity				
Commission	37	37	37	0
Commission Appellate Adjudication	6	6	6	0
Congressional Affairs	9	9	9	0
General Counsel	61	60	60	0
Public Affairs	15	14	14	0
Secretariat	27	28	28	0
Executive Director for Operations	24	23	23	0
Total	179	177	177	0

MANAGEMENT AND SUPPORT PROGRAM: Policy and Direction

This cost center covers NRC central policy direction, legal advice for the Commission, analysis of long-term policy issues, administrative proceeding review and advice, liaison with outside constituents and other government agencies, and executive management services for the Commission.

This cost center comprises the following seven activities: Commission, Commission Appellate Adjudication, Congressional Affairs, General Counsel, Public Affairs, Secretariat, and Executive Director for Operations.

Commission

The Commission is the governing body of the Nuclear Regulatory Commission. It is responsible for determining the fundamental policy and for guiding staff offices to ensure that the civilian use of nuclear energy is regulated in a manner consistent with the public health and safety, environmental quality, national security, and antitrust laws.

Commission Appellate Adjudication

The Office of Commission Appellate Adjudication assists the Commission in its disposition of appeals of licensing board decisions and other adjudicatory matters coming before the Commission. The office reviews administrative proceedings and keeps the Commission advised of decisions that must be made. It consults directly with the Commission, advising it in formulating opinions and on the discretionary exercise of its supervisory authority over agency adjudication. The office monitors cases pending before licensing boards and associated matters, provides analyses and options to the Commission, and drafts adjudicatory decisions and orders, as necessary.

Congressional Affairs

The Office of Congressional Affairs assists the Chairman, the Commissioners, and senior NRC staff with congressional matters; coordinates relations between the agency and Congress; and serves as liaison between the Commission and congressional committees, congressional subcommittees, and individual members of Congress.

The primary objective of this activity is to ensure that Congress is kept fully and currently informed about agency activities and that congressional requests and inquiries are responded to in a timely manner. The Office of Congressional Affairs provides the Chairman, the Commissioners, and senior NRC staff with relevant and current information pertaining to major legislative activities likely to affect the agency. Additionally, the Office seeks to ensure that individual members of Congress are

kept currently informed about significant NRC activities that might affect their respective States and districts.

General Counsel

The General Counsel is the Commission's chief legal advisor The Office of the General Counsel (OGC) advises the Commission and the Office of Commission Appellate Adjudication on adjudicatory matters requiring the Commission's decision; represents the Commission in Federal court of appeal proceedings to review Commission orders and rules; and, in cooperation with the Department of Justice, represents the Commission in court proceedings affecting NRC's programs in the Federal district courts and the Supreme Court

The OGC provides legal advice to the Commission on the implementation of employee conduct regulations, external investigations and internal audits, and on the application of Federal openness laws to Commission functions and on rulemaking activities, drafts proposed legislation for Commission consideration and advises the Commission on the legal and policy implications of recently enacted legislation as well as proposed legislation, that is referred to the Commission for comment by OMB or Congress and it's committees; provides legal services to NRC offices to assist them in accomplishing their mission, and represents the NRC staff in public rulemaking hearings

The Special Counsel for Public Liaison provides assistance to the staff on the design and implementation of participatory and consensus-building processes for involving the public in NRC regulatory activities.

The OGC also provides advice and assistance to the Commission and NRC offices on matters involving interagency and international agreements, procurement, intellectual property, budget, security, and administrative functions, and represents the NRC in administrative hearings involving procurement, personnel, personnel security, labor relations, and equal employment opportunity matters.

Public Affairs

The Office of Public Affairs assists the Chairman, the Commissioners, and senior NRC staff by managing and directing the NRC's public affairs program This includes developing and administering agency policies and procedures for informing the public and the news media of NRC policies, programs, and activities, informing NRC management of media coverage of activities of interest to the agency, working with civic groups and administering a small cooperative program with public

schools; advising management on conducting public meetings; and providing information on NRC activities to the news media and general public.

Secretariat

The Office of the Secretary of the Commission provides executive management services to support the Commission and to implement Commission decisions including the planning, and scheduling of Commission business, and preparing the Commission's meeting agenda.; manages the Commission's decisionmaking process, codifying Commission decisions in memoranda directing staff action, monitoring staff compliance of pending actions and commitments through the Commission Tracking System, and maintaining the Commission's official records, adjudicatory dockets, and rulemaking dockets; processes and controls Commission correspondence; issues and serves adjudicatory decisions and orders on behalf of the Commission and individual licensing boards; receives and distributes comments from the public in rulemaking proceedings; operates and manages the NRC Public Document Room and it's electronic systems for providing access to NRC's publicly available documents; directs and administers the NRC Historical program, serving as Systems Manager for the Commission's historical database of policy decisions; and functions as the NRC Federal Advisory Committee Management Officer. The Office of the Secretary will also continue to expand and integrate office automation initiatives into the Commission's administrative systems by introducing improved processes for handling electronically the Commission's hearing and rulemaking dockets, voting, correspondence, and tracking activities.

Executive Director for Operations

The Office of the Executive Director for Operations (EDO) manages the agency's strategic planning process, examines policy issues, supervises and coordinates operational activities of program and EDO staff offices, and implements the Commission's policy directives pertaining to these offices. The EDO is the Chief Financial Officer of the Commission and the chief operations and administrative officer. The EDO is authorized and directed to discharge such licensing, regulatory, and administrative functions of the NRC and to take actions that are necessary for day-to-day operation of the agency.

Resource and Administration Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	33,923	35,442	36,387	945
Contract Support	96,619	92,466	89,289	-3,177
Travel	373	383	273	-110
Total	130,915	128,291	125,949	-2,342
Budget Authority by Activity ($K)				
Controller	11,373	13,058	12,832	-226
Administration	51,633	50,339	51,125	786
Information Resources Management	49,647	45,908	44,596	-1,312
Personnel	6,145	6,715	6,503	-212
Training	5,087	4,235	4,032	-203
Small Business and Civil Rights	990	1,027	1,052	25
Permanent Change of Station	6,040	7,009	5,809	-1,200
Total	130,915	128,291	125,949	-2,342
Full-Time Equivalent Employment by Activity				
Controller	107	107	104	-3
Administration	188	186	182	-4
Information Resources Management	138	139	138	-1
Personnel	64	64	63	-1
Training	9	9	9	0
Small Business and Civil Rights	7	7	7	0
Total	513	512	503	-9

MANAGEMENT AND SUPPORT PROGRAM: Resource and Administration

This cost center covers financial management, administrative and logistical support, information resources management, personnel, and training.

This cost center comprises the following seven activities Controller, Administration, Information Resources Management, Personnel, Training, Small Business and Civil Rights, and Permanent Change of Station.

Controller

The Office of the Controller provides the overall financial management of the agency. This activity includes exercising budget and accounting responsibilities, providing agency senior management with analyses of policy, program, and resource issues; and ensuring adherence to applicable legislation, Office of Management and Budget (OMB) circulars and bulletins, and other Governmentwide financial management directives, including the Chief Financial Officers (CFOs) Act of 1990, the Omnibus Budget Reconciliation Act of 1990, the Federal Employees Pay Comparability Act of 1990, the Federal Managers' Financial Integrity Act of 1982, the Prompt Payment Act and amendments, and OMB Circulars A-123, "Internal Control Systems," A-127, "Financial Management Systems," and A-134, "Financial Accounting Principles and Standards."

Compliance with the CFOs Act includes developing procedures and activities in concert with the Inspector General to produce a financial statement that is consistent with OMB Circular A-134 and an audit report; assisting offices as required in reviewing and revising NRC management directives and procedures for conformance to OMB circulars and with the requirements of the Act; developing and using performance measures to assess program and financial performance, preparing periodic reports and analyses on financial management, including an annual audited financial statement to the Chairman and the Director of OMB and periodic reports to the Commission on budget execution; and conducting periodic reviews of agency financial management activities and providing training to allowance financial managers in all aspects of compliance with the CFOs Act.

The second legislative requirement, the Omnibus Budget Reconciliation Act of 1990, requires the NRC to recover 100 percent of the agency's budget authority through license and annual fees. Activities to meet this requirement include developing and issuing rules that reflect recovery of 100 percent of the budget authority each year; providing policy, processing applications, and analyzing fee-related data for approximately 3,000 reactor and fuel cycle license amendments and issuing the resultant 1,300 bills; analyzing data and processing approximately 2,000 bills for reactor and fuel cycle inspections; processing more than 5,000 incoming applications subject to flat fees; issuing approximately 8,000 annual fee bills per year; and responding to Congressional constituent and licensee correspondence regarding fee billings.

MANAGEMENT AND SUPPORT PROGRAM: Resource and Administration

To fully comply with the requirements of the Federal Employees Pay Comparability Act of 1990, the NRC is changing to a new payroll/personnel system, which will be fully implemented in FY 1998. The current payroll system will be unable to meet future operational requirements.

Implementation of the requirements of the Federal Managers' Financial Integrity Act of 1982 and OMB Circulars A-123 and A-127, includes enhancing the NRC management control program, improving financial systems, providing training, and preparing reports to the President and Congress.

Compliance with the Prompt Payment Act includes processing more than 40,000 commercial vouchers for payment in a timely manner and accounting for and reconciling these payments.

Financial planning, a key part of this activity, includes coordinating the NRC strategic planning process, including developing instructions and procedures and modifying goals and objectives; providing guidance and resolving Commission questions; modifying guidance to implement Commission decisions; developing and issuing the agency's Five-Year Plan, which supports the agency's budget request to OMB and to Congress.

The Controller also manages the NRC internal budget development process by preparing guidance and instructions, reviewing and modifying budget structure, performing analyses for the CFO's use in decisionmaking, and maintaining detailed records and analyses to support the budget. Interaction with the Commission to resolve questions and implement Commission decisions is required. The Controller also develops the NRC budget request to OMB and to Congress and manages the overall budget justification process.

The Office of the Controller oversees agency budget execution by preparing quarterly base tables for Congress; developing monthly performance reports on budget execution for the Executive Director for Operations (EDO) and quarterly reports for the Commission; performing midyear reviews and other periodic budget execution reviews; managing the allotment and financial plan for Commission and EDO offices, including certification of the availability of funds; managing the agency's salaries and benefits allocation and estimating the agency's salaries and benefits requirements; ensuring administrative control of funds by maintaining expertise and interpreting appropriation law and policies; obtaining apportionments and reapportionments from OMB; managing the NRC allotment and financial plan process; and maintaining agency policy standards and procedures applicable to the administrative control of funds.

Other financial management functions and responsibilities in this cost center include performing required debt-collection activity; maintaining travel services while processing over 20,000 travel authorizations and travel vouchers per year; managing the agency's relocation services program; managing the NRC imprest fund; maintaining accounting policies; providing accounting training; developing and maintaining financial systems; providing financial and accounting data and reports to

agency management and other Federal agencies; maintaining appropriate master records for financial management; maintaining the NRC general ledger, including reconciling billings, collections, travel, and NRC accounts with Department of Treasury accounts; and developing and issuing the agency's Information Digest.

Administration

This activity provides for centralized administrative and logistical support services for the agency, specifically in the areas of procurement, duplicating, facilities and property management, transportation, security, printing, publications services, graphics, mail and distribution services, Freedom of Information Act requests, privacy protection, rulemaking support, local public document rooms (LPDRs), and public access to NRC electronic information as well as certain support services for the regional offices.

This activity includes contract support funds for rent payments to the General Services Administration (GSA) and real property operations costs totaling $24.6 million in FY 1997. These mandatory payments represent more than 64 percent of the total contract support costs for this activity.

Other requirements for contract support funds include transportation of persons and things including the rental or lease of motor vehicles from commercial vendors and government motor pools; funding for subsidies for public transit and for freight and express services; printing and reproduction including duplicating, contract printing, and photography services; security services to protect NRC personnel, property, and information including costs for guard services, personnel security investigations, and the NRC drug testing program; supplies, materials, postage, and equipment which include consumable supplies and office furniture, filing equipment, office machines, general equipment, draperies, and carpeting; and other operational costs which cover alterations and supplementary air conditioning, parking, automotive maintenance, fuel and tires, maintenance of office machines and security, duplicating, electronic composition and publication, and photography equipment, audiovisual and graphic services, assistance to LPDRs, translations, contract typing, mail and messenger services, and document distribution services.

Facilities and Property management activities include establishing policies, standards and procedures for NRC-wide space and building acquisition and utilization; providing support services for NRC headquarters space, buildings and facilities, including operation of the Administrative Service Center at the White Flint complex; administering the terms of the GSA delegation program applicable to all NRC headquarters buildings; maintaining liaison with GSA and other Federal agencies concerning space, buildings and facilities; providing direct support to headquarters and regional offices for interior space planning and layout services; and managing the day-to-day building and grounds maintenance activities at the White Flint complex. The property management activity controls and

accounts for over 30,000 items. This is accomplished by developing policies, procedures and guidelines implementing the Federal Property Management Regulations; administering the agency's automated official system of records for property assets; providing direction to the agency's cadre of property custodians; planning, conducting and reconciling annual physical inventories of the NRC's controlled property; disposing of property excess to the agency's needs through various methods including transfers to GSA, or other Federal agencies, abandonment or destruction, administering the NRC program for donation of excess computers to elementary and secondary schools; and providing monitoring of the regional property management programs. This activity also includes the receipt, control and distribution of all supplies and furniture necessary to meet the needs of NRC employees and a variety of warehouse services including support for all office moves.

This activity is conducted to develop and implement agencywide contracting policies and procedures; direct and coordinate contracting activities; negotiate, award, administer, and close out contracts, task orders, purchase orders, grants, cooperative agreements, and interagency agreements; provide advice and assistance to offices on procurement regulations and requirements and methods of meeting program objectives consistent with such requirements; settle claims and terminations; perform other normal duties of a contracting office as specified in the Federal Acquisition Regulation and the Federal Information Resources Management Regulation; provide oversight for regional procurement activities to ensure small purchase actions are awarded in accordance with procurement regulations and agency policy; provide oversight of office placement and monitoring of NRC/DOE work orders to ensure that sound contracting principles are applied to DOE laboratory agreements; assist program offices in cost negotiation and administration of laboratory agreements; develop agency policy for placement and monitoring of DOE laboratory agreements; conduct training for agency staff in contract management; and develop and implement screening criteria to determine if an organizational conflict of interest exists in placing work with DOE; implement the Procurement Reinvention Laboratory to substantially reduce the lead time and staff resources necessary to conduct NRC procurements, ensure both technical and cost competition, and the award of contracts to small businesses; and issue requests for quotations, review vendor price proposals, and award small purchase actions using electronic commerce technology.

This activity is also conducted to develop policies, procedures, and rules for implementing the Freedom of Information Act, Privacy Act, Federal Register Act, and Regulatory Flexibility Act; develop and review amendments to agency regulations and petitions for rulemaking; provide advice and assistance to offices and the public on filing petitions for rulemaking; administer the agency's management directives system; provide a centralized system for announcing public meetings of the staff and public access to NRC electronic information; and direct and coordinate local public document room activities near all reactor sites and near certain other fuel cycle and waste sites throughout the United States. This activity also provides centralized agencywide publication control and processing, word processing and scanning services, technical writing and editing services, mail and distribution services, and translation services; publishes regulatory and technical reports; provides

direction and coordination of agencywide document composition, duplicating, and contract printing through Government Printing Office contractors; copy management, photography, and audiovisual and related services; and automated reports processing and proofreading services agencywide, including electronic communication with the regional offices and contractors.

This activity administers the agency's overall security program to protect NRC personnel, property, and information. This includes the safeguarding of restricted data and national security information documents or material at all NRC offices and at contractor, licensee, certificate holder, and other facilities containing such documents or material; the safeguarding of sensitive intelligence information and providing intelligence support services to the Commission and senior management; the operation of NRC secure communications systems; the NRC drug testing program, which requires over 900 random drug tests annually of employees and applicants; the physical protection of personnel and property at headquarters and other agency locations; the NRC criminal history check program, under which approximately 50,000 fingerprint cards are processed each year; implementing the National Industrial Security Program and new national security-related Executive Orders' requirements; and the yearly processing and maintenance of security clearances and/or special nuclear material access authorizations for agency employees, consultants, contractors, licensees, and others, as well as security approval for access to Unclassified Safeguards Information, unescorted access to NRC facilities and to nuclear power plants, and access to NRC sensitive automated information systems and data by NRC contractors.

Under the facilities security program, security personnel conduct facility/organization security surveys of headquarters, regional office, licensee, certificate holder, and contractor interests to ensure protection of classified information and sensitive, unclassified information and NRC personnel and property; provide security support to the Commission, Atomic Safety and Licensing Board Panel, Advisory Committee on Reactor Safeguards, and other NRC offices during public meetings nationwide; assist regional office staff, as requested, with the installation of security systems, such as key card reader access control systems compatible with the system used at headquarters; manage and administer contract security force activities for contract compliance and cost efficiencies; manage and administer the physical security program for all headquarters buildings, including visitor control (50,000 visitors annually), the operation of a comprehensive access control and alarm system, the issuance of NRC photo identification badges, and the deployment of protective personnel. Security personnel, in response to the Department of Justice's "Vulnerability Assessment of Federal Facilities," plan, initiate and administer the acquisition and operation of facilities security upgrades to NRC occupied facilities which include package screening equipment, improved exterior lighting, additional perimeter barriers and various facility security systems. Security personnel also manage a security awareness program to ensure employees are aware of their responsibilities with respect to the protection of NRC assets, including classified and sensitive unclassified information.

Information Resources Management

This activity provides for guidance, oversight, and coordination of all policy, planning, and execution of information resource management functions, and manages program activities related to the agency's acquisition, management, and use of Federal Information Processing (FIP) resources. Major responsibilities include strategic planning and acquisition support, advanced technology support, end-user support services, technology infrastructure support, telecommunications support, automated systems development and integration, and information and records management. It provides for the essential services and technical means used by the agency staff to receive, store, retrieve, manipulate, process, and transmit information in support of the agency's health and safety mission. The activity is managed by the Office of Information Resources Management (IRM) and in the regions as appropriate.

IRM leads an information technology (IT) planning and budgeting process that supports the NRC mission, focuses on IT throughout the agency, enhances the ability of senior executives to make IT decisions, and is integrated with the agency's five-year planning process. IRM develops and maintains clear policies and standards to support NRC's IT strategy and comply with Federal IRM regulations and standards. IRM ensures that FIP resource acquisitions provide quality products and services in a timely manner to meet customer needs and accommodate rapid changes in technology.

IRM ensures compliance with applicable government computer security laws and regulations, including the Computer Security Act of 1987 (Public Law 100-235). As part of the NRC's IRM Review Program, coordinated by the agency's Designated Senior Official (DSO), IRM conducts periodic reviews of its activities to assess compliance with the Paperwork Reduction Act of 1980 and the Federal Information Resources Management Regulation, Subparts 201-221.

IRM provides direction and coordination for the assessment of advanced and emerging information technologies and the transfer of appropriate technologies to the NRC environment, with a special focus on high performance computing. This is accomplished by monitoring the development of international and national computer and telecommunications initiatives such as those resulting from National Performance Review recommendations and the National Education and Research Network (established by the High Performance Computing Act of 1991); identifying, evaluating, and selectively demonstrating where the application of new information technology, tools, and techniques can improve productivity and the accomplishment of agency objectives, both for technical and administrative applications; and participating in and promoting greater collaboration with other government agencies, Federal laboratories, academia, industry, international organizations, and internal organizations, particularly in the area of high performance computing.

IRM provides for the timely and effective acquisition, installation, and maintenance of workstation hardware and software by implementing a workstation upgrade strategy that ensures adequate

performance, reliability and functionality to support the agency's LAN-based applications and by implementing an off-the-shelf software upgrade strategy to ensure agencywide compatibility for key applications and maintain a common-user interface agencywide.

IRM provides comprehensive, integrated radio, voice and data communications, networking, and connectivity services for the NRC by providing local and long distance voice and data services through the use of systems such as the governmentwide Federal Telecommunications System (FTS 2000) and the local Washington Interagency Telecommunications System (WITS)

IRM also maintains a single multi-function local and wide area network using an open systems architecture to provide connectivity and high-speed information transfers among workstations, NRC-owned minicomputers, and outside locations such as Southwest Research Institute, the DOE laboratories, timesharing facilities, licensees, and Federal and State agencies, and will upgrade network infrastructure functionality to expand support for new technologies and to integrate new agencywide office automation functions

IRM manages and supports NRC multi-user computer facilities and their associated operating systems software to provide reliable and capable platforms for developing and operating NRC multi-user applications. IRM is also continuing to implement and maintain test and operational environments required by new distributed multi-user computing, such as client-server.

IRM provides quality customer support including workstation hardware and software support, by providing technical assistance for agency office automation workstations and software (such as word processing, electronic mail, spreadsheet, communications, and graphics) that are part of the agency infrastructure, and assisting customers with establishing access and communicating with timesharing facilities and other outside locations Additionally, IRM provides essential library services, including reference information, online literature searches; acquisition, processing, and circulation of technical books, periodicals, reports, industry codes and standards; and access to offsite commercial information services.

IRM develops, acquires, and maintains information systems for agencywide office automation functions using the most effective technologies. Toward this end, IRM is aggressively adopting new distributed computing technologies, such as client-server; using commercial off-the-shelf software, software developed by other agencies, and cross-servicing in preference to customized development when appropriate and cost effective; adopting a standard life-cycle management approach for major systems covering project initiation, design, development, testing, operation, training, and retirement; and assessing systems development methodologies and procedures to ensure that the public's access to NRC information is considered, with the goal that new systems and modifications to systems either preserve or improve the public's access to NRC information

IRM is also applying technology to reduce paperwork and improve NRC's ability to communicate and access information both internally and externally through the use of information technology, such as electronic forms and Electronic Information Exchange (EIE), including Electronic Data Interchange (EDI); and selectively applying work process redesign to agencywide systems to examine and streamline work processes before automation technology is applied.

IRM manages shared data and documents as agency resources to ensure that they are accessible, secure, and reliable. IRM plans to improve data quality and increase capability to access and share data across all agency information systems, with a focus on key business areas, through the use of information engineering, standards, and data administration. Additionally, IRM will update the agency's document management capabilities to improve the integrity and accessibility of the agency's document collection in support of current and anticipated needs, by replacing the current Nuclear Documents System (NUDOCS) to improve internal and public access to documents and provide an agency repository for electronic records . IRM is reviewing the current inventory of applications seeking opportunities to make additional public information electronically accessible; and evaluating opportunities to make information beyond documents, e.g., information in databases, application systems, and other formats, available to the public.

IRM ensures that information collections imposed on the public and licensees are supported by specific agency needs and have practical utility and that the collection methodology is effective without imposing an undue burden. To do this, IRM continues to manage and improve information-collection activities as required by the Paperwork Reduction Act, supplemental statutory requirements, and OMB implementing guidance; and to automate standardized forms to promote the electronic exchange of information between NRC and its licensees.

IRM manages NRC records and other documents as agency resources to ensure that they are complete and accurate, accessible, and are retained in accordance with government regulations. This is accomplished by: assisting in identifying NRC-specific records and determining disposition schedules; maintaining a Central File Facility, streamlining and further automating agency record/document management processes, reducing reliance on paper, reducing or destroying duplicate records, and increasing the use of electronic record keeping systems and media; processing documents for storage in NUDOCS; ensuring NRC vital records are maintained at the Federal Emergency Management Agency's relocation site in a format that facilitates their retrieval; providing archival storage and retrieval of agency documents consistent with the Federal Records Act and the Federal Information Resources Management Regulation; and supporting the management of records associated with the licensing process to ensure they are complete, accurate, and accessible.

Personnel

The Office of Personnel (OP) provides effective recruitment, organization, utilization, and development of the agency's human resources through an integrated career management system, plans and implements NRC personnel policies, programs, and services; administers agencywide recruitment, staffing, compensation, and position management; provides for training, awards and benefits administration, employee health and fitness assistance, and counseling services, provides labor relations policy guidance and negotiates the collective bargaining agreement; collects, analyzes, and provides data on NRC's work force and supports agencywide equal employment opportunity and affirmative action programs and activities, and provides administration and guidance for the human resources strategic planning effort.

Personnel management and organizational activities include recruitment, staffing, and placement; compensation; position management; administration of employee and executive awards, personnel policy and program development, performance management; Federal labor relations and employee relations services; organization and management analyses; support to the Executive Resources Board and its subgroups, including the Performance Review Board and Recertification Performance Review Board; the occupational health and safety program; the wellness/fitness program; and the child development center. Personnel management activities also include equal employment opportunity programs, which encompass minority career development; handicapped employee and upward mobility programs; and special recruitment and other specialized activities, such as the differing professional opinion process.

OP also provides secretarial and clerical support to meet the short-term needs of headquarters offices through the assignment of Central Support Unit staff or acquisition of temporary services from the private sector. OP manages this function in response to agency requirements

Training

Training and development activities by the Office of Personnel (OP) provide all education and training (other than reactor technology and associated technical training under the purview of the Technical Training Center) for agency headquarters and regional staff. This includes graduate fellowships; scholastic support of cooperative education program students, retraining of NRC employees; support for the Technical Training Center qualifications training; individual employee, supervisory, management, and executive development training; equal employment opportunity and affirmative action; career development counseling; regulatory process; and other internal and external training and development activities to improve employee performance. OP also provides for organizational development, including management succession activities, team building, and rotational assignments, and agencywide support for improving training delivery through the development and application of

improved or alternative methods and increased employee training opportunities utilizing the Professional Development Center.

Small Business and Civil Rights

The Office of Small Business and Civil Rights (SBCR) identifies small and minority businesses and those run by persons that are capable of meeting NRC contractual requirements and provides assistance to them on how to do business with the agency. The activity also includes the functions and duties related to equal employment opportunity and civil rights matters within the NRC to increase the employment of minorities and women in the agency and ensure a climate for improved employee morale by promoting and maintaining counseling activities and supporting advisory committees made up of special emphasis groups The activity comprises three major programs: (1) the Small and Disadvantaged Business Utilization Program, (2) the Civil Rights Program, and (3) the Federal Women's Program.

Activities under the Small and Disadvantaged Business Utilization Program are authorized by Sections 8 and 15 of the Small Business Investment Act of 1958, as amended. Responsibilities include locating and referring small and disadvantaged businesses for procurement awards, negotiating a monetary goals program with the Small Business Administration for awarding NRC contracts to small and disadvantaged businesses and monitoring the results on a quarterly basis, monitoring NRC's procurement list to ensure equitable participation of small and disadvantaged businesses, offering advice and consultation to NRC offices on capabilities of small and disadvantaged business firms, disseminating information to such firms interested in NRC contracting procedures, and assisting historically black colleges and universities to secure grants and contracts from the NRC.

The civil rights activities are responsive to the Civil Rights Act of 1964, as amended, and are implemented by 29 CFR Part 1614 of the Equal Employment Opportunity (EEO) Commission regulations. The activities include developing, monitoring, and evaluating NRC's Affirmative Action Program; advising and assisting the Office of Personnel on the recruitment of minorities and women and EEO training for managers and employees; providing advice to senior management on civil rights and EEO matters; and developing and administering EEO counseling activities and the EEO complaints process. Activities also include supporting special emphasis and employee advisory groups; annually setting goals for the hiring and advancement of minorities and women; tracking agency performance on all affirmative action and EEO matters; and addressing any EEO issues resulting from financial assistance provided under Section 274 of the Atomic Energy Act of 1954, as amended, and the agency program for providing grants to colleges and universities.

The Federal Women's Program (FWP) was established in October 1967 as a result of Executive Order 11375, which added gender to other prohibited forms of discrimination in the Federal

Government In August 1969, Executive Order 11478 integrated the FWP into the overall Equal Employment Opportunity Program, placing it under the stewardship of agency directors of equal employment opportunity The purpose of the FWP is to expand and enhance opportunities for NRC women employees This includes advising management and EEO officials of any policies and practices that are, or appear to be, sex discrimination or that serve as barriers in the workplace; staying in touch with the NRC work force to identify any problem areas, assisting the Office of Personnel in recruitment actions directed toward women, participating in developing the agency affirmative action plan, maintaining communication with women's organizations and participating in meetings, conferences, and seminars within and outside the agency on issues relating to the FWP, and coordinating and supporting the Federal Women's Program Advisory Committee

Permanent Change of Station

This activity is carried out to ensure that NRC personnel who are required to change duty stations are afforded the required relocation services and other expenses related to permanent change of station (PCS) services and PCS moves, such as expenses incurred in connection with the sale of a residence, relocation of household goods, subsistence while occupying temporary quarters, and other miscellaneous moving expenses.

Special Technical Programs Cost Center

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	7,775	7,826	7,600	-226
Contract Support	4,264	3,654	2,941	-713
Travel	775	709	575	-134
Total	12,814	12,189	11,116	-1,073
Budget Authority by Activity ($K)				
International Programs	6,055	5,532	5,405	-127
State Programs	2,822	4,556	4,022	-534
DOE/DOD Projects	363	382	0	-382
Educational Grants	1,090	757	750	-7
Small Business Innovation Research (SBIR)	1,842	55	0	-55
Nuclear Materials Management and Safeguards System (NMMSS)	642	907	939	32
Total	12,814	12,189	11,116	-1,073
Full-Time Equivalent Employment by Activity				
International Programs	60	54	52	-2
State Programs	30	33	33	0
DOE/DOD Projects	4	4	0	-4
Nuclear Materials Management and Safeguards System (NMMSS)	1	1	1	0
Total	95	92	86	-6

MANAGEMENT AND SUPPORT PROGRAM: Special Technical Programs

International Programs

This activity includes developing and implementing policies and programs on international issues; administering the Commission's responsibilities in international areas comprising nuclear nonproliferation, reactor safety and regulatory development, radiation protection, materials safety, international safeguards and waste management; facilitating NRC access to foreign nuclear health and safety-related information and NRC technical cooperation with foreign countries and international organizations; and maintaining liaison with the Executive Branch, particularly the National Security Council, Arms Control and Disarmament Agency, Office of the Vice President, Departments of Defense, State, Energy, and Agency for International Development on international matters. This activity ensures that NRC has effective relationships with international organizations and foreign governments. The establishment and maintenance of such relationships contribute to the assurance of U.S. nuclear safety and help support U.S. national security and other U.S. foreign policy objectives.

U.S. initiatives at Presidential Summits, and at the Gore-Chernomyrdin Commission, may require NRC participation and could result in additional requests for safety assistance to the New Independent States (NIS) of the former Soviet Union and Central and Eastern Europe (CEE). The NRC provides assistance in the areas of strengthening independent regulatory organizations in these countries through training and technology transfer. International nuclear safety assistance and cooperation is expected to expand in the Pacific Rim countries with rapid growth in their economies and electric energy sectors. These activities will require a continued and focused commitment of staff resources.

On September 20, 1994, the United States signed the international Convention on Nuclear Safety, which will impose responsibilities on the NRC when it enters into force which is expected to occur in 1996. At that time, the Commission will be required to implement several of its major elements, including preparation of a national report and participation in review meetings--all of which will require sustained commitment of staff resources.

The agency will also continue its active cooperation in nuclear safety and safeguards during FY 1997 with about 32 countries, and with Taiwan, the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA). Special attention will be paid to ensuring that the IAEA and NEA programs are coordinated. NRC assistance to Russia, Ukraine, Armenia and Kazakstan of the NIS and to CEE will also continue but at possibly lower levels depending on available funding for foreign assistance. The NRC may also initiate nuclear safety cooperation agreements with several countries in the early stages of establishing a nuclear power program that might use U.S. nuclear technology to assure that it is being employed in a safe manner.

MANAGEMENT AND SUPPORT PROGRAM: Special Technical Programs

The Nuclear Safety Attache at the U.S. Mission to UN Systems Organization in Vienna, a position provided by the NRC, represents U.S. Government views on nuclear safety and radiation protection issues at the IAEA and with other diplomatic missions in Vienna and helps provide both programmatic and policy oversight of IAEA's nuclear safety program.

The NRC will also continue to participate as a member of interagency U.S. Physical Protection Review Teams to exchange technical information with representatives of foreign governments on physical protection procedures and practices and to host reciprocal visits to the United States. The NRC will continue to support IAEA-sponsored international safeguards activities deterring nuclear proliferation. The NRC will assist the IAEA in inspection activities at selected U.S. nuclear facilities, as required. The NRC will continue to participate in the management and direction of interagency groups supporting the strengthening and implementation of IAEA safeguards. During FY 1997, the NRC will also continue to assist the regulators in Russia, Ukraine, and Kazakstan, in developing and implementing national systems for accounting and control of nuclear material and physical protection. The objective of this program is to develop systems of material control and accounting and physical protection that will include a body of regulations, guides, technical review criteria, implementation standards and procedures, and an inspection program.

State Programs

This activity provides for cooperation, oversight, technical assistance, and liaison with States, local governments, Indian tribes, interstate organizations, and other Federal agencies. This ensures adequate protection of public health and safety from the hazards associated with the use of radioactive materials in Agreement States and ensures nuclear safety policy and program information are shared among governmental organizations.

These activities include implementation of the revised Agreement State program, including final procedure development. The Agreement State Program includes additional training courses and workshops to provide Agreement State personnel with information on implementing several new initiatives and to obtain substantive input from the Agreement States on the implementation of these initiatives. These initiatives include implementation of: 1) a policy statement, which draws a clear distinction between what is required for both the adequacy and compatibility of an Agreement State Program; and 2) an Integrated Materials Performance Evaluation Program, which guides a common process to assess the performance of Agreement States and NRC's regional materials programs. As a part of these responsibilities, the NRC administers agreements with the 29 Agreement States that exercise jurisdiction over the use of radioactive materials; provides assistance to other States seeking Agreement State status; conducts major training courses, special topic workshops, and technical meetings for Agreement State staff; conducts periodic reviews of Agreement State programs for adequacy and compatibility with NRC programs; provides early and substantive involvement of the

States in NRC rulemaking and other regulatory efforts, provides assistance to State and local governments in radiation control; and conducts an all-Agreement States annual meeting. The administration and oversight of the Agreement State program ensures there is a coherent, consistent, national program for the regulation of Atomic Energy Act materials that provides adequate levels of safety among all Agreement State and NRC programs.

The agency also coordinates activities of interest to State, local, and Indian tribal governments with other NRC offices, and participates in activities conducted by the Conference of Radiation Control Program Directors, Inc. In addition, the agency negotiates memoranda of understanding with States on various NRC and State activities involving mutual cooperation, monitors State legislation, and informs the Commission and staff of significant State actions concerning nuclear issues. It also regularly consults and conducts meetings with Governor-appointed State liaison officers and maintains contact with national organizations, such as the National Governors' Association, National Association of Regulatory Utility Commissioners, National Congress of American Indians, and National Conference of State Legislatures, to identify NRC regulatory initiatives affecting States and to keep NRC apprised of those organizational activities that could affect the agency.

The NRC will also provide limited technical assistance to the Low-Level Waste (LLW) compacts; State regulatory bodies; and the States of South Carolina and Washington, where the existing LLW disposal sites are located. On request, the NRC will provide technical assistance to Agreement States that are in various stages of developing and implementing plans to regulate new LLW disposal facilities and on matters pertaining to storage.

This activity also provides for Federal liaison support to increase cooperation and communication between the NRC and other Federal agencies on policy matters. The Federal liaison program manager conveys the Commission's viewpoints and policies to Federal agencies and notifies NRC senior management about significant actions by other Federal agencies that may affect NRC actions, plans, and policies.

Department of Energy\Department of Defense (DOE\DOD) Projects

In FY 1996, the NRC will review and comment on proposed DOD and DOE reactor projects and facilities, as requested. In FY 1997, this work will be done on a reimbursable basis.

Educational Grants

In FY 1997, the NRC will continue to support research educational grants. Pursuant to sections 31(a) and 141(b) of the Atomic Energy Act of 1954, as amended, the NRC is authorized to award

grants and cooperative agreements to educational institutions, nonprofit institutions, State and local governments, and professional societies. The NRC grant program is administered in accordance with the Federal Grant and Cooperative Agreement Act of 1982, OMB guidance, and NRC policies and procedures. This program fosters public understanding of nuclear safety, enlarges the body of knowledge and technical information, and enhances the protection of public health and safety. Such support to educational institutions is limited to no more than one percent of the total annual budget for the Office of Nuclear Regulatory Research. At present, NRC grants support a variety of professional meetings and university-based research projects.

Small Business Innovation Research (SBIR)

Public Law 97-219 requires Federal agencies with extramural research budgets in excess of $100 million to establish SBIR programs to stimulate technological innovation by small businesses. The NRC has participated in this program since it was established in FY 1982, and historically has reviewed about 110 to 130 SBIR proposals each year and has awarded about 10 to 12 contracts. In recent years, the NRC extramural research budget has been below the $100 million threshold for participation. In light of current budget reductions, which have reduced the NRC's research program well below the SBIR participation threshold, the NRC will not participate in the SBIR program in FY 1997.

Nuclear Materials Management and Safeguards System (NMMSS)

In FY 1997, the NRC, in conjunction with DOE, will continue to operate and maintain the Nuclear Materials Management and Safeguards System to track the movement of domestic and foreign nuclear materials.

INSPECTOR GENERAL PROGRAM

INSPECTOR GENERAL PROGRAM

(Dollar amounts in tables represent thousands of dollars ($K). In text, whole dollar amounts are used. Staff numbers represent full-time equivalents (FTEs).)

Total FY 1997 Estimate $5,000,000

	FY 1995 Enacted	FY 1996 Estimate	FY 1997 Estimate	
			Request	Change from FY 1996
Budget Authority by Function ($K)				
Salaries and Benefits	4,192	4,400	4,400	0
Contract Support	653	360	360	0
Travel	235	240	240	0
Total	5,080	5,000	5,000	0
Full-Time Equivalent Employment				
Audits	19	19	19	0
Investigations	19	19	18	-1
Inspector General and Resource Management and Operational Support	6	6	6	0
Total	44	44	43	-1

EXPLANATION OF RESOURCE CHANGES

There are no significant resource or program changes in FY 1997

DESCRIPTION OF PROGRAM

The NRC's Office of Inspector General (OIG) was established in April 1989 to provide the Commission and the Congress with an independent review and appraisal of the NRC's programs and operations to ensure their effectiveness and efficiency and to prevent and detect fraud, waste, and abuse. The OIG accomplishes its mission by performing audits, and investigations, and by reviewing existing and proposed legislative and regulatory initiatives.

INSPECTOR GENERAL PROGRAM

The NRC and the OIG each have some unique responsibilities in support of the agency's mission. The NRC's primary mission is to provide adequate assurance that public health and safety is protected in the commercial use of nuclear materials and in the operation of nuclear facilities. The OIG, therefore, plays a critical role by assessing and reporting on NRC's efforts to ensure that its safety-related programs are operating effectively.

Similarly, the NRC is responsible for ensuring that individuals who identify nuclear safety concerns regarding the use of nuclear materials do not suffer adverse job actions resulting from such activities. The OIG continually assesses the NRC's efforts to combat this type of unlawful discrimination.

The major OIG activities are described in more detail below.

Audits

The audit program is designed to provide assurance to the Commission and to Congress that NRC programs and operations are working efficiently and effectively. To do this, the OIG audit staff conducts performance and financial audits. Performance audits focus on the NRC's administrative and program operations. The OIG's financial audits review the NRC's internal control systems, transaction processing, and financial systems.

In FY 1997, the OIG will perform 12 to 15 audits. The audits planned for this period are based on a comprehensive annual audit plan that includes input from the NRC Commission, Congress, the General Accounting Office (GAO), the Office of Management and Budget (OMB), the Department of Energy (DOE), and the nuclear industry, as well as from the OIG staff. The plan identifies key, high-risk, high-cost programs for audit, including the NRC's inspection, research, waste management, and information resources management programs. Audit surveys of these areas identify issues that require further examination.

In the financial management area, the audit plan includes several audits needed to meet legislative and OMB requirements. These audits will address various financial management issues, including the annual audit of the NRC's Financial Statement that is mandated by the Chief Financial Officers Act. Furthermore, the NRC is required by the Omnibus Budget Reconciliation Act of 1990 to recover approximately 100 percent of its budget authority. In FY 1997, the NRC will collect approximately $462.8 million in fees from the industries that it regulates. Therefore, the agency must employ sound financial practices to comply fully with its legislative mandates. The OIG assists the agency in meeting these objectives by conducting financial audits.

Additionally, in FY 1997, the OIG will assess and report on the NRC's response to recommendations made by the OIG and other audit entities, such as the GAO, concerning NRC programs.

INSPECTOR GENERAL PROGRAM

Investigations

The Inspector General Act of 1978 requires the OIG to receive and investigate allegations concerning violations of Federal laws and regulations, as well as allegations of mismanagement, waste, and danger to public health and safety. The mission of the investigative program is to perform investigative activities related to the integrity of the NRC's programs and operations.

By nature, investigations are primarily reactive. However, the OIG periodically performs root cause analyses and conducts other preventive initiatives such as integrity awareness training. The investigative caseload is primarily determined by the number of allegations received and the complexity of the issues raised. On the basis of historical trends, the investigative workload has continually increased in complexity since the inception of the OIG in April 1989. The IG received 434 allegations in FY 1995; 89 investigations and event inquiries were opened and 110 were closed. The OIG expects that a similar number of cases will be opened and closed during this planning period. In addition, investigators may also participate, on occasion, as observers in agency task forces that examine ways to strengthen agency operations.

Inspector General and Resource Management and Operational Support

The Inspector General's staff consists of secretarial support and legal counsel. The OIG Counsel provides independent advice on issues concerning criminal law, criminal procedure, evidence, and constitutional law as these relate to the OIG's investigative program. Among the other legal responsibilities are appropriations law, financial management statutes and regulations, and procurement and funding rules in support of the OIG's auditing program. The OIG Counsel furnishes litigation support to the Department of Justice and others as necessary, and advises in matters concerning personnel, labor law, and Privacy Act and Freedom of Information Act issues. The OIG Counsel also provides detailed review and comment for existing and proposed legislation, regulations, directives, and policy issues that affect agency programs and operations.

The Resource Management and Operational Support staff provides operational support to the OIG. It formulates and executes the OIG budget, prepares the OIG's semiannual report to Congress, operates an independent personnel program, and serves as the liaison and point of contact for activities of the President's Council for Integrity and Efficiency. This staff also provides automated data processing support, security management, space planning, and procurement support to the OIG.

SPECIAL SUPPORTING TABLES

SPECIAL SUPPORTING TABLES

This section contains the following:

Legislative Program Projections which provides a summary of the NRC's budget authority and outlays by appropriation for FY 1995-2002.

A report on drug testing, required by 31 U.S.C. 1105(a), which describes the NRC's drug testing activities conducted in accordance with Executive Order 12564

A summary of the NRC's reimbursable work agreements including the source and amount of funding, a project description, a description of the billing procedures and the extent of full-cost recovery, and a justification for the NRC's involvement in each project.

U. S. NUCLEAR REGULATORY COMMISSION
LEGISLATIVE PROGRAM PROJECTIONS
(Dollars are in Millions)

	SALARIES AND EXPENSES APPROPRIATION		INSPECTOR GENERAL APPROPRIATION	
	Budget Authority	Budget Outlays	Budget Authority	Budget Outlays
FY 1995 Enacted	518.8	524.7	5.1	5.3
FY 1996 Estimate	468.3	480.9	5.0	5.0
FY 1997 Estimate	475.3	473.6	5.0	5.0
FY 1998-2002[1]				

[1] FY 1998-2002 budget authority and budget outlays will be determined by the Office of Management and Budget (Budget Procedures Memorandum No. 814, Supplement No. 2, February 11, 1996, "Outyear Estimates for FY 1997 Budget").

U.S. NUCLEAR REGULATORY COMMISSION
REPORT TO CONGRESS ON DRUG TESTING

The Nuclear Regulatory Commission's (NRC's) Drug Testing Plan was approved in August 1988, and all components of the NRC's drug testing program for employees and applicants remain in place. Drug testing requirements imposed by the NRC upon the nuclear industry through regulations are separate from this program and are not covered by this report. The NRC's Drug Testing Program under Executive Order (E.O.) 12564 includes random, applicant, voluntary, follow-up, reasonable suspicion and accident-related drug testing. Testing was initiated for non-bargaining unit employees in November 1988 and for bargaining unit employees in December 1990 after an agreement was negotiated with the National Treasury Employees Union.

The NRC positions which meet the following criteria are considered testing designated positions and the employees are subject to random testing:

(1) Regional and Headquarters employees who have unescorted access to vital areas of nuclear plants and Category I fuel facilities;

(2) Employees who have assigned responsibilities or are on call for Regional or Headquarters incident response centers;

(3) Employees who require access to Sensitive Compartmented Information, Foreign Intelligence Information, or who require access to other classified information (e.g., National Security Information or Restricted Data); and

(4) Employees who are motor vehicle operators carrying passengers.

Approximately 1,720 NRC employees occupy testing designated positions and are subject to random testing. Potential selectees interviewed for positions in these categories are subject to applicant testing.

Approximately 950 tests of all types were conducted between October 1, 1994 and September 30, 1995. Since each employee subject to random testing has an equal chance of being selected each time, some NRC employees were randomly tested more than once. All testing results have been negative except for two employees who tested positive. One employee completed a treatment program and follow-up testing and continues to be subject to random testing. A second employee received a fifteen day suspension without pay and is subject to follow-up testing for a period of two years.

SPECIAL SUPPORTING TABLES: Report to Congress on Drug Testing

Internal quality control reviews were completed during the past year to ensure NRC's program continues to be administered in a fair, confidential and effective manner.

The NRC's Drug Testing Program remains firmly based upon the principles and guidance provided through E.O. 12564, Public Law 100-71, Department of Health and Human Services guidelines and Commission decisions.

U. S. NUCLEAR REGULATORY COMMISSION SUMMARY OF REIMBURSABLE WORK AGREEMENTS (New Budget Authority)		
	FY 1995	FY 1996 (Estimate)
INTERNATIONAL AGREEMENTS		
Cooperative Threat Reduction	$1,924,520	$0
Foreign Cooperative Research Agreements	$2,989,910	$3,500,000
Nuclear Safety Initiatives for the New Independent States	$8,900,000	$0
Regional Energy Efficiency Project	$1,000,000	$1,500,000
ADMINISTRATIVE AGREEMENTS		
Consumer Product Safety Commission	$4,000	$13,000
Criminal History Program	$870,690	$1,195,000
Criminal Investigator Academy	$24,000	$30,000
Department of Justice	$15,000	$0
Information Access Authorization Program	$3,651	$5,000
Library of Congress	$0	$48,750
Material Access Authorization Program	$0	$50,000
OTHER AGREEMENTS		
Licensing and Regulatory Compliance/Fissile Materials	$150,000	$300,000
Radiation Exposure Monitoring System	$400,000	$0
Cassini and Mars Pathfinder Missions	$400,000	$0
TOTAL	$16,681,771	$6,641,750

SUMMARY OF REIMBURSABLE WORK AGREEMENTS

1. Cooperative Threat Reduction.

Source: Defense Nuclear Agency (DNA)

Description of Work: The NRC will assist Russia, Ukraine, and Kazakstan in the development and implementation of nuclear safeguards capability as part of the U.S. Cooperative Threat Reduction (CTR) Program. The NRC will evaluate these countries' Material Control and Accounting (MC&A) and Physical Protection (P/P) programs and assess needs for assistance in systems development, design, installation, implementation and follow-on user training.

Justification for NRC Involvement: Under the auspices of the CTR Program for former Soviet nuclear weapons and materials, the NRC and the Department of Energy have established bilateral technical assistance programs with these countries in the areas of MC&A and P/P. The objective of the U.S. assistance is to help these countries improve their capabilities to effectively safeguard nuclear facilities and materials. This project is being conducted with funds authorized by Congress in the Soviet Nuclear Threat Reduction Act of 1991 (Nunn-Lugar) and successor legislation such as the Freedom Support Act of 1992.

Reimbursement Procedures: The DNA issues an Interagency Cost Reimbursable Order (IACRO). The IACRO funds the NRC to perform efforts agreed to by the Interagency Coordinating Group. The IACRO is entered into pursuant to the authority of the Economy Act of 1932, as amended (31 U.S.C. 1535) and adheres to Federal Acquisition Regulation (FAR) 6.002 and other applicable Federal Laws and Regulations. Reimbursement Vouchers (SF 1080) are submitted to DNA.

2. Foreign Cooperative Research Agreements (FCRA).

Source: Various foreign entities

Description of Work: The NRC enters into nuclear safety cooperative research agreements with foreign entities under the NRC's Foreign Cooperative Nuclear Safety Research Program for the purpose of exchanging nuclear safety-related information, conducting joint projects of mutual interest, and interacting with other organizations concerned with nuclear safety. The research programs subject to these cooperative research agreements are carried out as a part of the agency's nuclear regulatory responsibilities. The foreign entities participating in the Cooperative Nuclear Safety Research Program enter into cooperative research agreements that provide in-kind technical or financial contributions to the NRC.

Justification for NRC Involvement: These foreign contributions are provided to the NRC in return for access to information which has been developed and continues to arise from the NRC research programs before final publication and release to the public domain. These contributions support broad safety research programs and also allow the foreign entity direct participation in the execution of the research program. Both parties benefit from the cooperative efforts. The NRC is

authorized by its annual appropriation legislation to receive, retain, and use funds under the Cooperative Nuclear Safety Research Program for those activities associated with the program

Reimbursement Procedures: The foreign entity provides an advance of funds to the NRC using the Fedwire Deposit System (i.e., electronic funds transfer) or by check/money order

3. **Nuclear Safety Initiatives for the New Independent States (NIS): Energy Efficiency and Market Reform Project.**

Source: U.S. Agency for International Development (AID)

Description of Work: The purpose of this AID initiative is to continue to implement nuclear safety initiatives in Russia, Ukraine, Armenia, and Kazakstan. Activities under this agreement include: (1) analytical support activities, (2) development of a training center for regulatory personnel; (3) creation of an incident response center, (4) work in the technical area of probabilistic risk assessment; and (5) assistance in legal enforcement and development of draft regulatory legislation.

Justification for NRC Involvement: The NRC is assisting AID in providing support to the NIS in the area of nuclear safety due to the NRC's specialized expertise in the regulation of civilian uses of nuclear energy and materials.

Reimbursement Procedures: The AID provides budget authority in advance to the NRC for expenses for travel, contractor support, and administrative expenses (e.g., interpreters). Salary costs for NRC employees working under this agreement are not reimbursed by AID.

4. **Regional Energy Efficiency Project.**

Source: U.S. Agency for International Development (AID)

Description of Work: The purpose of this AID initiative is to promote the efficient and environmentally sound use of energy in the countries of Eastern and Central Europe. Technical (nuclear safety) subject areas include: Temelin review; international code assessment, severe accident and risk and accident management; nuclear safety orientation and training which includes conducting legal, regulatory, and inspector training, conducting Probabilistic Risk Assessment Basics Course, Root Cause Incident Investigation Course, hosting nuclear specialists, training at the NRC's Technical Training Center in Chattanooga, Tennessee; and as supporting membership in the International Piping Integrity Research Group. Efforts in Lithuania will include assisting in preparing and updating Lithuanian norms and standards, preparing Ignalina specific inspection guidance, and developing an Ignalina Systematic Evaluation program.

Justification for NRC Involvement: The NRC is assisting AID in providing support to the countries of Eastern and Central Europe in the area of nuclear safety due to the NRC's specialized expertise in the regulation of civilian uses of nuclear energy and materials.

Reimbursement Procedures: The AID provides budget authority in advance to the NRC for expenses for travel, contractor support, and administrative expenses (e.g., interpreters). Salary costs for NRC employees working under this agreement are not reimbursed by AID.

As costs are incurred by the NRC, a receivable is created in the NRC accounting system and bills are issued to AID in accordance with the terms of the agreement. Upon collection of all costs

incurred under the agreement and the deobligation of any uncosted obligations, any remaining unobligated allotment balance will be withdrawn by the NRC.

5. Consumer Product Safety Commission.

Source: Consumer Product Safety Commission (CPSC)

Description of Work: Provide one employee for Personnel Assistant support for the Office of Human Resources Management at the CPSC

Justification for NRC Involvement: Agreement entered under the authority of Section 601 of the Economy Act, as amended 31 U.S.C. 1535 and 1536.

Reimbursement Procedures: Payments are made via the Department of Treasury's On-Line Payment and Collection (OPAC) system.

6. Criminal History Program (CHP).

Source: NRC licensees

Description of Work: The NRC has entered into a written agreement with the FBI's Identification/Information Management Division to conduct user fee non-criminal justice fingerprint card checks for which the FBI provides criminal history records for applicants if such exist in FBI files and/or data bases.

Justification for NRC Involvement: The Atomic Energy Act (AEA) of 1954, as amended, provides NRC the authority to require each licensee or applicant for a license to operate utilization facilities to fingerprint each individual who is granted unescorted access to nuclear power facilities (NRC licensees) or access to safeguards information to undergo an FBI criminal history fingerprint check.

Reimbursement Procedures: Funds are received from the licensees for fingerprint checks. Payments are made to the FBI via the Department of Treasury's On-Line Payment and Collection (OPAC) system. Salary costs for NRC employee administering this program are not reimbursed by the licensees.

7. Criminal Investigator Academy.

Source: Department of State, Department of Housing and Urban Development

Description of Work: Provide one clerical employee in support of the training objectives of the Inspector General Criminal Investigator Academy, Federal Law Enforcement Training Center.

Justification for NRC Involvement: Section 601 of the Economy Act of June 30, 1992, as amended 31 U.S.C. 1535 and 1536. Government Employees Training Act [5 U.S.C., Sec. 4103(a)].

Reimbursement Procedures: Payments are made via the Department of Treasury's On-Line Payment and Collection (OPAC) system.

8. Department of Justice.

Source: Office of Small and Disadvantaged Business Utilization, Department of Justice (DOJ).

Description of Work: Provide program development assistance in the Office of Small and Disadvantaged Business Utilization, DOJ.

Justification for NRC Involvement: Section 601 of the Economy Act, as amended 31 U S C 1535 and 1536.

Reimbursement Procedures: Payments are made via the Department of Treasury's On-Line Payment and Collection (OPAC) system.

9. Information Access Authorization Program (IAAP).

Source: NRC licensees

Description of Work: Licensee personnel with access to classified national security information and restricted data are subject to personnel security background investigations conducted by the Office of Personnel Management (OPM) at the NRC's request to ensure their eligibility for such access. This background investigation is necessary under the Atomic Energy Act (AEA) and Executive Order 12968 to determine their eligibility for access to classified information.

Justification for NRC Involvement: Title 10 of the Code of Federal Regulations, Part 25, issued under the authority of the AEA to protect the public health and safety and provide for common defense and security.

Reimbursement Procedures: Funds are received from the licensees for background investigations. Payments are made to OPM via the Department of Treasury's On-Line Payment and Collection (OPAC) system. Salary costs for NRC employees administering this program are not reimbursed by the licensees.

10. Material Access Authorization Program (MAAP).

Source: NRC Licensees

Description of Work: Licensee personnel with access to, or control of, any special nuclear material are subject to personnel security background investigations conducted by the Office of Personnel Management (OPM) at the NRC's request to ensure their eligibility for such access. Such screening is necessary to protect against the theft or diversion of special nuclear material or acts of sabotage.

Justification for NRC Involvement: Title 10, Code of Federal Regulations, Part 11, issued under the authority of the Atomic Energy Act to protect the public health and safety and the common defense and security.

Reimbursement Procedures: Funds are received from the licensees for background investigations. Payments are made to OPM via the Department of Treasury's On-Line Payment and Collection (OPAC) system. Salary costs for NRC employees administering this program are not reimbursed by the licensees.

11. Library of Congress.

Source: Library of Congress.

Description of Work: Provide one senior investigative employee in support of a high-level, sensitive investigation.

Justification for NRC Involvement: Agreement entered under the authority of Section 601 of the Economy Act of June 30, 1992, as amended 31 U.S.C. 1535 and 1536.

Reimbursement Procedures: Partial reimbursement of employee's salary and benefits are made via the Department of Treasury's Online Payment and Collection System (OPAC).

12. Licensing and Regulatory Compliance/Fissile Material.

Source: Department of Energy (DOE)

Description of Work: The NRC will provide review and advice regarding regulatory plans being developed by DOE which address alternatives being considered for disposition of surplus fissile materials. The NRC will assist in assuring that the information being developed to support DOE's selection of a disposition alternative(s) is correct, and that the strategies developed by DOE for licensing are effective and can be implemented in a timely manner so as to meet mission objectives.

Justification for NRC Involvement: Following President Clinton's September 1993 nonproliferation policy statement, an Interagency Working Group was established to review alternatives for disposition of surplus plutonium from nuclear weapons activities of the U.S. and the former Soviet Union. The DOE has the lead role in evaluating technical options and developing analyses. As part of its analysis, the DOE is developing regulatory plans that assess the technical viability and potential impediments, and estimate the schedule and cost, associated with licensing the facilities for each alternative. To support this effort, the DOE has requested that the NRC provide review and advice regarding these regulatory plans.

Reimbursement Procedures: The DOE is billing quarterly for all direct staff hours expended for work specified in the Statement of Work requirements included in Interagency Agreement DE-AI01-95MD10203. The hourly rate which is charged to DOE for NRC direct staff time is established in 10 CFR Part 170. This agreement is entered into pursuant to the authority of the Economy Act of 1932, as amended 31 U.S.C. 1535 and adheres to Federal Acquisition Regulation (FAR) 6.002 and other applicable Federal Laws and Regulations.

13. Radiation Exposure Monitoring System.

Source: Department of Energy

Description of Work: The purpose of this effort is to assist the DOE Office of Health Physics and Industrial Hygiene in (1) the development and implementation of health surveillance support systems that will collect, maintain, and report radiation exposures; (2) the innovative application of lessons learned from related experiences; and (3) the sharing and transfer of technology currently used by the NRC to support DOE's program.

Justification for NRC Involvement: The DOE has initiated work to enhance the support systems for health surveillance of DOE employees, DOE contractors, and visitors to DOE facilities.

The first step in this effort was to evaluate their Radiation Exposure Monitoring System (REMS) that is used to collect, maintain, and report personnel radiation exposures. A contractor was selected to conduct this evaluation to take advantage of their research and lessons learned while developing, operating, and maintaining the NRC Radiation Exposure Information System, which has a similar function.

Reimbursement Procedures: As costs are incurred by the NRC, a receivable is created in the NRC accounting system and bills are issued to the ordering agency in accordance with the terms of the agreement. Upon collection of all costs incurred under the agreement and the deobligation of any uncosted obligations, any remaining unobligated allotment balance will be withdrawn by the NRC.

14. Cassini and Mars Pathfinder Missions.

Source: National Aeronautics and Space Administration (NASA)

Description of Work: The Interagency Nuclear Safety Review Panel (INSRP) was formed by a Presidential Security Directive. The purpose of the panel is to perform an independent review of the safety of launches of space vehicles carrying nuclear material (small quantities are exempt). The NRC staff will assist the INSRP as technical advisor. In this role NRC staff will: (1) attend significant meetings of the panel; (2) participate in drafting and sign significant correspondence of the panel; (3) support selected subpanel meetings and other technical meetings (e.g., Biological and Environmental Effects, Meteorology, Uncertainty Working Group); (4) participate in the drafting of the Safety Evaluation Report for the Cassini Mission and other missions, as required; (5) participate in producing independent calculations estimating the risks from launch of nuclear materials, if necessary (6) review major safety-related mission documents and provide comments as appropriate; and (7) participate in periodic briefings of the Office of Science and Technology Policy.

Justification for NRC Involvement: NRC involvement was requested by the President's Science Advisor, Director of the Office of Science and Technology Policy (OSTP), in a letter to the Chairman, NRC. The NRC accepted participation in INSRP as Technical Advisor, in a letter to Dr. Gibbons from the Director, NMSS, dated November 28, 1994.

Reimbursement Procedures: The NASA is billed quarterly for all direct staff hours expended for work specified in the Statement of Work requirements included in the interagency agreement established by Purchase Order Number W-18,806. The hourly rate which is charged to NASA for NRC direct staff time is established in 10 CFR Part 170. This agreement is entered into pursuant to the authority of the Economy Act of 1932, as amended 31 U.S.C. 1535 and adheres to Federal Acquisition Regulation (FAR) 6 002 and other applicable Federal Laws and Regulations.

NRC FORM 335 (2-89) U.S. NUCLEAR REGULATORY COMMISSION
NRCM 1102, 3201, 3202

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8 PERFORMING ORGANIZATION - NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)
Division of Budget and Analysis
Office of the Controller
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

9 SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)
Division of Budget and Analysis
Office of the Controller
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

10 SUPPLEMENTARY NOTES

11 ABSTRACT (200 words or less)

This report contains the fiscal year budget justification to Congress. The budget provides estimates for salaries and expenses and for the Office of the Inspector General for fiscal year 1997.

12 KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)
Budget
Congressional Budget Submittal
Fiscal Year 1997

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WEDNESDAY, MARCH 27, 1996.

FEDERAL ENERGY REGULATORY COMMISSION

WITNESS

ELIZABETH A. MOLER, CHAIR, FEDERAL ENERGY REGULATORY COMMISSION

Mr. FRELINGHUYSEN. Ms. Elizabeth A. Moler is Chair of the Federal Energy Regulatory Commission. Thank you very much for being with us. You've given us a prepared statement and certainly we'll include it in toto in the record, and certainly we'd love to hear from you.

OVERVIEW

Ms. MOLER. Thank you very much, Mr. Chairman. It is a pleasure to be here. I certainly understand the continuing extenuating circumstances that have prompted your colleagues to go to keep the Government running.

It is a pleasure to appear before you today to present the FY 1997 budget for the Federal Energy Regulatory Commission. I will give you a short oral statement summarizing our request. Our request for FY 1997 for appropriated funds is for $159.4 million—to be supplemented by $5 million unexpended authority from prior years. Together these funds will meet our FY 1997 full funding requirement of $164.4 million. We are small in comparison to the other agencies you have met with today. This funding level will support a staffing level of 1,463 full-time equivalent positions. This is an increase of 10 FTE's over our current fiscal year, and this increase is due entirely to our increased work load in the electric utility area.

Last year the Congress mandated a 20 percent cut over two years in our Natural Gas and Oil Program area. By the end of fiscal year 1997 we will have made the full 20 percent reduction. We are also reducing our hydropower staff. So, the only area where we are growing is where our work load is growing significantly.

All the staffing decreases from the Hydro and Gas Programs will be reallocated to the Electric Program. Beginning in FY 1995 the Electric Program requirements have simply exceeded our ability to continue without additional resources.

On the financial side, the Commission received a clean bill of health from an independent audit firm for the second straight year. We're proud of this accomplishment. Very few agencies in town have managed to accomplish this. And I would also note that we've had 15 percent fewer staff in the financial management area than we had two years ago.

ELECTRIC POWER

Let me turn briefly to our program areas starting with electric power. The electric industry is now in the midst of a competitive revolution. Last March our Commission issued a notice of proposed rulemaking that would require the utilities we regulate to open up their transmission systems on a nondiscriminatory basis to all wholesale sellers of electricity. Our purpose is to make competition a reality in wholesale power markets. The rule will also be indispensable for states who wish to consider taking competition even further in the form of other kinds of open access programs. We are analyzing over 20,000 pages of comments on our proposed rulemaking from over 400 commenters. We will issue a final rule this spring. For me personally, and for the Commission as a whole, this is a very exciting time. The result will be lower electricity costs for consumers nationwide. Our preliminary economic analysis of the program shows consumer savings of between $3.75 to $5.5 billion annually. This will be a significant accomplishment.

The coming of the competition in the electric industry has profound effects on our day-to-day work load at the Commission. In the short run we face an increase in complex and novel implementation issues that will stretch our resources. For one thing, we will have to reexamine virtually every transmission tariff of every utility under our jurisdiction. I can't say it will be easy, but I know it will be worth it. The Open Access Initiative has already had a profound impact on our work load. Total filings have more than doubled since FY 1991. We expect them to triple by FY 1997. Compliance and rate filings tripled from FY 1991 to FY 1995. We expect them to quadruple this year as compared to their level of five years ago. This means 3,500 rate and compliance filings compared to 750, 770 as recently as five years ago.

Requiring fair access to transmission will be only the beginning of massive changes in this industry. There will be a great number of new and difficult issues that we will have to grapple with. In my prepared testimony I have highlighted some of these issues.

I would like to emphasize one key point. Fostering competition does not necessarily mean deregulation. There are differences. For the foreseeable future, transmission will continue to be a regulated monopoly. Continuing regulation of transmission will be the essential foundation of a competitive generation market which we do expect to see substantially deregulated in the near future.

To sum up, we are entering an exciting period in electric power. I believe that our budget proposal with its modest increase of 10 FTE's will let us meet the challenge and do our job to bring all Americans the benefits of a more competitive electric power industry. Simply put, we need these additional resources to do the job well.

NATURAL GAS

Let me turn now to natural gas where we oversee more than 130 interstate pipelines. Natural gas supplies almost a quarter of this nation's total energy needs. In 1992 the Commission issued a landmark order known as Order No. 636. It required pipelines to restructure their transmission operation to bring the benefits of com-

petition in selling gas to consumers. Order No. 636 is part of a market-driven revolution in the gas industry just as we are now seeing years later in the electric industry. However, as with electric power, competition in the gas industry is not the same thing as deregulation.

Regulating for competition is an extraordinarily complex task. In many ways the work and issues that we face in today's natural gas program are even more difficult than those we saw before Order No. 636. Regulating for competition presents challenges that require new approaches from those we have used before. A competitive marketplace requires increased flexibility on our part. It also requires us to be able to respond quickly to the industry's needs so that regulatory lag does not translate into lost opportunities in the marketplace. We see this in proposals for transmission tariffs and in pipeline filings seeking authorization to construct new facilities. They want answers fast. And increasing competition in electric power is beginning to feed back into the natural gas regulatory program in the form of requests for new types of gas services that we must review.

To sum up here, the problems we face in regulating natural gas are both novel and important. We have been able to absorb a substantial cut in our natural gas staff in recent years, but any further reduction would threaten our ability to encourage competition and efficient pipeline expansion while protecting customers from the market power that still exits in certain segments of the industry.

HYDROPOWER

I'll finish by talking about our hydropower program. We regulate more than 1,600 projects that produce about 48 percent of all the nation's renewable energy. For the past several years the biggest effort in our hydro area has been the large bulge of licenses that expired in 1993. We continue to work at these cases and will resolve them as soon as possible. Hydro issues can be highly contentious. They involve everyone's back yards. Rivers are very personal to lots of people. We are committed to doing the consensus-building necessary to reach voluntary settlements of these relicensing cases whenever we can. We can continue to honor this commitment provided we are able to devote enough resources to the process.

This is particularly important because we face another wave of relicensing in the next decade. We are trying to learn what we can from this Class of 1993, as it is affectionately known, and to develop cooperative approaches to working with other agencies and the dozens of parties who typically participate in individual relicensing cases. We've also begun to examine our relicensing regulations to see if we can make the process work better.

Dam safety remains one of our most important jobs. We continually work to find better ways to ensure the safety of the aging dams we regulate, and we're proud of the job we have done thus far.

The FY 1997 budget reflects a reduction in the resources earmarked for our hydro program. Further reductions should be possible when the relicensing cases are resolved, but we're not near there yet.

In conclusion, Mr. Chairman, my colleagues and I are committed to the goal of increasing competition in both the natural gas and the electricity industries. We are endeavoring to use our resources wisely and appreciate this Subcommittee's continued support of our efforts. That concludes my oral statement. I'll certainly be happy to answer any questions you may have.

FERC INDEPENDENCE

Mr. FRELINGHUYSEN. I have quite a few for you, some of which may be included in the record and you can respond at another date. The Administration has proposed the Federal Energy Regulatory Commission Act of 1995 which would remove FERC from the organizational umbrella of the Department of Energy. Under the bill the Secretary of Energy would retain authority to initiate Commission rule-making proceedings and to intervene in Commission proceedings. In your opinion does this legislation serve any substantive purpose other than perhaps making the DOE budget appear to be smaller?

Ms. MOLER. We would welcome the independence. The Federal Power Commission was independent until the Department of Energy Organization Act back in 1977. It would reduce some work load and burden in natural gas—a substantive change there. It would also mean we wouldn't have to fight with DOE about things like FTEs and budgets, which of course an agency would like not to have to do. We do recognize the Administration's continued interest in having some policy input into our process. Over time the Secretary has used the authority to initiate rule-makings very sparingly, and I would say appropriately so I don't see that as a problem. Plus, the bill doesn't seem to be going anywhere.

FTE LEVELS

Mr. FRELINGHUYSEN. You're right. I had some questions. You made a case for the additional full-time equivalent employees——

Ms. MOLER. Yes, sir.

Mr. FRELINGHUYSEN [continuing]. In your prepared and your oral comments. I'm not sure I'm totally satisfied with that explanation. I understand that there are more obligations, but why isn't it possible to do some reductions on the other side of the ledger?

Ms. MOLER. It is difficult——

Mr. FRELINGHUYSEN. Because Congress obviously has set some goals here and we need everybody to cooperate.

Ms. MOLER. I understand that, and we are endeavoring to do so. It is impossible to continue to run a program where the numbers of filings before you are going from say 770 to 3,650 in the space of five years with the same number of people. You just can't. We have not quadrupled our budget request in this area. We have been very conservative in the number of additional people we have asked for. If you look, there's a chart on page 4 of our budget that shows how this work load is just skyrocketing. We have come down 20 percent or will by the end of next year, in the natural gas and oil area. We are coming down in the hydropower area, and we're coming down in administration. But the work load and the impact of this—and we have to do a good job—make it impossible for us

to take as many people out of those other program areas and still meet the needs.

PURPA REFORM

Mr. FRELINGHUYSEN. I have several questions that relate to PURPA. Earlier this year you testified before Chairman Schaefer's Committee, the House Committee on Energy and Power——

Ms. MOLER. Yes, sir.

Mr. FRELINGHUYSEN [continuing]. Regarding administrative reform of the PURPA. You asserted, it's my understanding, that FERC could do no more, but frankly FERC had its hands full with open-access regulation and it doesn't make sense for FERC to do more on PURPA, to somewhat paraphrase your words, if Congress is about to repeal it. At the same hearing, I'm not sure whether you're aware of this, Deputy Secretary Curtis of the DOE, argued that, "The most legitimate concerns relating to the implementation of Section 210 of PURPA could be addressed in targeted changes to PURPA implementing regulations. FERC can and should fine-tune the implementation of PURPA." Although I realize you're an independent regulatory agency, you're still part of the Department of Energy. Yet your statement seems to be somewhat at odds with the Deputy Secretary, and some might say in direct conflict. Which position, the one adopted by FERC or the one adopted by the Department of Energy actually accurately represents where the Administration stands on PURPA reform?

Ms. MOLER. As a member of an independent regulatory commission I'm not authorized to speak on behalf of the Administration. Let me tell you where I'm coming from on PURPA, and Secretary Curtis was next to me so I'm certainly aware of his comments. We have had this immense work load with implementing our Open Access Rule. As I've described earlier, we've been struggling with the amount of resources. We cannot do everything at once. It was my judgment that achieving the consumer savings of $3 to 5 billion a year that could be achieved from the Open Access Program was the highest priority for the Commission. So we've decided to do that first. At the same time, there have been bills introduced in both the House and the Senate to repeal PURPA. So I was saying that it doesn't make sense to me as an administrator to undertake a major rulemaking if the statute is about to be repealed. Now, as to those bills, you're a better judge than I am about whether those bills are likely to be successful this year or not. I have made a commitment to look at whether we can reform our PURPA program after we finish our Open Access Initiative. So, if it turns out that Congress is not going to do anything to PURPA, we will certainly look at whether there are some things that we can do on our own with respect to PURPA. So, it's really basically a question of timing.

Mr. FRELINGHUYSEN. So, what you're saying in short is you'd be willing to take some administrative action to reform PURPA if Congress doesn't get organized enough to move ahead with repeal?

Ms. MOLER. I'm willing to look at the program and see what we can do, yes, sir. I don't have an idea now what we should do.

Mr. FRELINGHUYSEN. In previous testimony before Congress you indicated that most of the problems associated with PURPA implementation were a thing of the past. Yet as your own recent experi-

ence with the California BRPU proceedings suggest, some are still trying to use PURPA to deal with long-term costly qualifying facilities contracts. I'm informed that the Commission has pending before it two petitions, one filed by the PURPA Reform Group and the other filed by the Edison Electric Institute that would address some of the flaws in the current PURPA program. Has the Commission responded to either of these petitions and if not what is your time table?

Ms. MOLER. As I said in response to your previous question, it's a question of timing. We do have these two petitions. We have been unable to deal with them because of resource and manpower limitations at the present time. And we've also been hanging back, if you will, while the legislation is pending. After our heads have come back above water from the avalanche of the Open Access Implementation we will certainly look and see whether the petitions make sense to us. We will seek comments and ideas for looking at PURPA. There certainly is another side of the story as you can well imagine. The PURPA Reform Group and the E.E.I. petition basically are views of the utilities. All of the independent power producers are apoplectic at some of the ideas that are presented in those petitions and our job will be to figure out what makes sense from a public policy point of view.

Mr. FRELINGHUYSEN. Many of those groups are visiting our offices I can assure you on both sides of the equation. Now, what could the Commission do to ensure that PURPA is implemented fairly and in a manner consistent with the transition to a more competitive marketplace, and could the Commission allow States to play a larger role in administering PURPA contracts?

Ms. MOLER. States are the entities that are primarily responsible for implementing PURPA, but according to as the statute as required by FERC guidelines. You mentioned earlier the California BRPU decision. In that decision we took a look at a California program that had grown up over the years and that, frankly, I thought was—and the Commission determined was—in a time warp. California is implementing open access at retail. Yet as you mentioned, they were requiring the utilities to acquire additional resources that they did not need, and they had not allowed all would-be participants to participate in the bidding process. In that decision we said, if you're going to do PURPA implementation, you have to allow all resources to bid, and that was a very significant decision in the annals of PURPA. That's why I believe, to a certain extent, we have stopped the PURPA hemorrhage as far as consumers are concerned where States are requiring utilities to acquire resources at above-market cost. We're just not allowing that to happen anymore, and we drew a line at that point. That's why I think the PURPA problem is not nearly as severe as it would have been if we had not taken that action. But there may be more that we can do.

NATURAL GAS RESTRUCTURING ORDER NO. 636

Mr. FRELINGHUYSEN. Shifting gears here, the Natural Gas and Oil Pipeline Program, you've mentioned the FERC Order Number 636. Is the order meeting its goals?

Ms. MOLER. Yes. Exceeding its goals.

Mr. FRELINGHUYSEN. Exceeding its goals. And what measurable benefits have consumers enjoyed? If one had to explain how would one explain it?

Ms. MOLER. Let me get the numbers. Before FERC Order No. 636, pipelines were primarily the entities that bought natural gas from the producers. They provided both the transmission of the commodity and the commodity itself in a bundled sale and sold it to local distribution companies, the local utilities. After Order No. 636 we took the pipeline out of the business of procuring the commodity and we let buyers and sellers get together in a good American way. There has been a very significant change in the marketplace because of this regulatory program. Competition has taken hold. Consumers have reaped billions and billions of dollars of benefits from this program in terms of lower consumer prices while, I might add, even paying the costs of the transition. New services are being invented every day, natural gas is functioning as a commodity, and the commodity itself is in a deregulated marketplace. I think you can look at lots of areas. I can go on at some length. There are market centers, places where lots of pipelines get together and people can purchase natural gas and have a variety of ways to get it transported to their city gate or to their factory. And it's a much more competitive marketplace, a much freer, much more robust marketplace. There have been environmental benefits as well. Significant environment benefits. And there have also been balance-of-trade benefits in terms of decreased purchases of foreign oil.

STAFF REDUCTION FOR NATURAL GAS AND OIL PROGRAM

Mr. FRELINGHUYSEN. Thank you for your response. Relative to full-time equivalents, in fiscal year 1995 there were 609 full-time equivalents in the natural gas and pipeline area. FERC's fiscal year 1997 budget request shows that it plans to use 595 FTE's for fiscal year 1996 and 533 for fiscal year 1997. In the fiscal year 1996 Conference Report Congress recommended, as you're aware, a 20 percent reduction in staff over the next two years which would result in a staff allocation of 487. Why has FERC been slow to respond to the Conference Report's recommendation?

Ms. MOLER. Frankly, I think some of your numbers are a little bit inaccurate. We measure our response off the number of positions authorized. When the Conference Report was enacted we were authorized to have 666 in the gas and oil program and we were then supposed to come down over two years. We have an interim plan of 585 people for fiscal year 1996 and our fiscal year 1997 goal is 533.

Mr. FRELINGHUYSEN. Just for the record, when did you last have 666 in gas?

Ms. MOLER. I'll be happy to supply that.

You would have to compare actual people on-board and compare actual with actual, or you have to look at authorized levels and compare authorized with authorized. Traditionally our numbers have been—as most agencies in town are—based on what the program is authorized at. If we can, we don't hire up to the authorized maximum. What we can do with less we obviously do. When I became Chair of the Commission, I imposed an across-the-board hir-

ing freeze throughout the Commission until we got a handle on FTE's. And I have husbanded those resources. It was obvious to me that our work load was decreasing and we simply didn't need to use all the people we were authorized to have and we haven't. So, we were underneath our ceiling in fiscal year 1995.

Mr. FRELINGHUYSEN. As you're aware, we're not the authorizing Committee. We need to clear this up, and I'm sure that whatever further information we can get from you we'll put in writing.

Ms. MOLER. Let me just conclude with one additional number. In fiscal year 1994 our actual usage, if you want to compare actual and authorized, was 664 which compares to an authorized level in fiscal year 1995 of 666. So, they're pretty close.

Mr. FRELINGHUYSEN. They are pretty close, but we'll do some more checking and if we have any questions we'll get back to you. FERC claims that the gas and oil industry responded to the severe weather with greater flexibility and reliability than ever before. Do you have data to support this claim?

Ms. MOLER. I think it's fair to say it's anecdotal. I'm sure if you think about two years ago, when we had the wild winter, there were reports of Washington Gas for example having pressure problems in part of its system, and there were significant voluntary curtailments; mostly interruptable, but some firm in capacity. This winter we had no such reports. In addition, we have authorized significant increases in capacity and we have natural gas being used in lots of parts of the country, pockets to be sure, but where it was not available before. The grid is expanding, and at lower prices. I consider that a success.

STRANDED COSTS RECOVERY

Mr. FRELINGHUYSEN. What similarities are there between the decontracting issue in the gas industry and the issue of stranded costs in the electric industry and how are these problems different in terms of the premise of providing reimbursement for prior arrangements?

Ms. MOLER. Let me describe how I think of the decontracting issue. After we issued Order No. 636 the local distribution companies, the local utilities, looked very carefully at what they needed. Because they're buying their own gas at the wellhead, and because of the change in the way we do rates, they are looking even more carefully at how much capacity they have to reserve on the pipelines. It turns out that it's cheaper to build storage and pull gas in and out of storage in the middle of the winter, and more efficient, than it is to have all that capacity under contract on a year-round basis. So, when they have an opportunity to do so they are signing up for less capacity at the present time than they used to. This is decontracting in our parlance or in the industry's parlance as well. When we adopted Order No. 636 we told the pipelines to get out of the merchant businesses I described earlier. They were no longer buying and selling a commodity. They had a lot of natural gas under take-or-pay contracts. So, we authorized them as a transition matter to pass through the costs of getting out of those contracts, and they had some facilities under contract that they were not allowed to keep as well. That is what, to us, are transition

costs in the natural gas industry. The total under Order No. 636 has been about $3 billion to date.

In the electric area we are, I think going to have a similar evolution. Our jurisdiction in the electric area is a lot narrower, but the industry is bigger. In the electric area we certainly have utilities that have contracts from third parties or they have their own power plants that are producing electricity at costs that are way above the current costs of producing electricity from new plants. We have a lot of utilities that have nuclear power plants, for example, that are very expensive if they hope to recover their capital costs, though they are very cheap to run on a marginal-cost basis. It's nine or ten cent power. You can build and operate a new power plant for 2½ or 3 cents. So, these above-market costs are what we will consider to be the stranded costs in the electric transition.

Our proposed rule tells the utilities that for the wholesale portion—we do wholesale, the state regulators do retail—that for the wholesale portion of those stranded costs they can pass through to their customers that are leaving them the costs that they had incurred in building the power plants to serve them. It's comparable to the cost that the pipelines had in getting out of the producer contracts. So, I think it's the take-or-pay or transition costs really rather than the decontracting. I think eventually in the electric industry as this competition takes hold and as things mature there will be a whole change in the contractual relationship between the utilities and their customers as well. But we're not seeing that yet.

DAM SAFETY

Mr. FRELINGHUYSEN. Thank you for your response. Shifting gears a little bit here relative I guess under the category of hydropower, you made some comments in your statement relative to dam safety remains as one of our most important jobs. Are you satisfied? You seem to be rather optimistic and positive about dam safety. And could you tell the Committee, quantify for the Committee how many dams we're talking about here that we have responsibilities for.

Ms. MOLER. Let's look at the numbers. We do have about 1,600 projects under our jurisdiction. Some of these projects have more than one dam. There are multiple facilities in a project. Every year we conduct about 2,600 safety inspections. We have regional offices and safety inspectors. They do a detailed examination of the dams. On a three-year basis they require seismic studies and so forth, and they impose safety requirements on the owners of these facilities. Some of the owners don't really like that a whole lot because it costs them money to keep them up. But a lot of our dams are 50 years old.

And we also run what are called emergency action plan drills for people who live below the dam in a river basin. They have a drill and what to do if there is a dam failure. It's a very successful program. We also do dam safety for the Nuclear Regulatory Commission and the Department of Energy and we have, knock on wood, had no fatalities in recent history. I think that's because of the professionalism of that program, and we're proud of our record.

MT. HOPE HYDRO PROJECT

Mr. FRELINGHUYSEN. Good to hear. It's reassuring. It's an issue that's raised periodically. Good to know that somebody is there checking. I have a question. I know you made some comments relative to hydropower and relicensing, and I would be remiss if I didn't mention that I had one in my back yard, the Mt. Hope Hydroelectric Project, and I think it's with a number of others that we'd like to see some action on. I just wondered if you could tell me what the status of that license is. This is in Morris County, New Jersey.

Ms. MOLER. Right. We licensed the project. They had a date by which they had to begin construction. Project economics had changed significantly since we relicensed the project, just as they have with nuclear power and these real cheap new generators in this marketplace using natural gas. It is my understanding that the licensee has had a great deal of difficulty securing financing. I'm certainly aware of the fact that the House has passed legislation to extend the project construction deadline. We can't do anything about that. It is out of our hands and in yours.

Mr. FRELINGHUYSEN So, at the moment, there's nothing you can do until we act. Is that, is that correct?

Ms. MOLER. Yes, sir.

HYDROPOWER RELICENSING

Mr. FRELINGHUYSEN. The National Hydropower Association has urged that the Commission revamp its relicensing procedures. Would it be possible to stagger these relicensing dates, and what effort is FERC making to streamline the overall relicensing process?

Ms. MOLER. The National Hydropower Association submitted to us a proposal that was the result of a 2-year study on their part and a great deal of discussion, dialogue, with other interested groups. They were hoping to come to us with a consensus among the interested groups, and unfortunately, that effort failed. They broke down in the final months of negotiations with the conservation groups over things like Intervener funding and some procedural things. I was not a part of those negotiations, so I'm really not intimately familiar with precisely the issues. We took the NHA proposal, we sought comments on it. The comments are now in. We got comments from 42, I think it is, groups, parties, what have you. We are evaluating those comments. In the meantime, however, some of the good ideas that they had, that they did achieve consensus on, are just happening. Licensees are working with interveners. They're working with them much earlier. We are doing what we can to facilitate settlement discussions where people are really willing to roll up their sleeves and try to settle these relicensing issues. And we're using our staff in ways that we've never used our staff before to see what we can do. We are beginning to evaluate the comments we received in response to the NHA proposal to figure out if it makes sense for us to change our official regulations in this area rather than just do the informal "roll up your sleeves" settlement kind of efforts that we've been doing to date.

JUDICIAL REVIEW WIN-LOSS RECORD

Mr. FRELINGHUYSEN. Thank you, two more questions and then we'll let you go and they'll be quite a number of questions we'll put into the record, and we'd appreciate your formal response to. Relative to litigation, what was the Commission's win/loss record with respect to judicial review of its decisions in the Federal Courts in 1995, and how much did it cost the Commission to litigate these appeals of its decisions?

Ms. MOLER. Our win/loss record in the last year was roughly 80 percent wins. We had 103 cases decided since 1992; 81.5 percent of them have been favorable, 21.5 unfavorable. The program costs about $2 million a year through our solicitor's office to litigate both our official orders as well as the other miscellaneous administrative litigation we get involved in.

POWER MARKETING ADMINISTRATIONS

Mr. FRELINGHUYSEN. And I think lastly, relative to power marketing administrations we've had quite a lot of debate in Congress about PMA's. To what extent is FERC's jurisdiction over the Federal Power Marketing Administrations under current law? What jurisdiction do you have over PMA's?

Ms. MOLER. We have very limited jurisdiction over PMA's. We have limited jurisdiction to review their rates, basically, and our scope of review is not like it is with electric, the privately-owned electric utilities that file rates with us. We just look to see if they're basically sufficient to cover their costs.

Mr. FRELINGHUYSEN. So if some were to be transferred to non-Federal entities, then you might have jurisdiction?

Ms. MOLER. Yes.

Mr. FRELINGHUYSEN. Should the new entities, if and when they're created, be subject to licensing requirements to the Federal Power Act?

Ms. MOLER. I believe that if the PMA's were to be privatized, and I underscore the word, "if," and I certainly understand how controversial that is up here——

Mr. FRELINGHUYSEN. Not controversial with me. Since I'm chairing the Committee, I can say just about anything I want——

Ms. MOLER. I have participated in a hearing on this subject. If they were to be privatized, I don't believe that the Federal Government would get a very good value unless you deal with the dams, unless you deal with licensing requirements for the hydroelectric facilities under their jurisdiction. It's just a major unknown. We suggested in response to the Resources Committee inquiry, and to the Energy and Power Subcommittee, that if they were to do this, they give some sort of automatic interim license for a period of time so that the purchaser would have some certainty about what its liability would be. We think that would enhance the value that the government would get from such a sale. I also believe that any sale of PMA's—or I'd even probably go further, and I believe that PMA's ought to have open access tariffs, and certainly any sale ought to be conditioned upon their adopting an open access tariff. They might be sold to a co-op, for example, or they might be sold to a municipal utility, or at least portions of them might be sold, and

those entities are outside the scope of our jurisdiction, so we could not force them to be open access. So I would condition any sale on an open access requirement.

STAFF DETAIL PROGRAM

Mr. FRELINGHUYSEN. And lastly, does FERC provide detailees to any non–FERC offices?

Ms. MOLER. We have a detailee at the present time at the Senate Energy and Natural Resources Committee. His detail expires, as of now, at the end of this Congress. We also currently have a detailee to the World Bank, and that's it.

Mr. FRELINGHUYSEN. All right, and are those figures or numbers similar for Fiscal Year 1995?

Ms. MOLER. Yes.

Mr. FRELINGHUYSEN. And anticipated in this Fiscal Year as well, 1997?

Ms. MOLER. Yes. We don't have a large detail program.

Mr. FRELINGHUYSEN. Okay. Well, thank you very much for your testimony, and I say on behalf of Chairman Myers and Mr. Bevill. I want to thank you for being here, for your statement and your generosity in terms of responding to my questions. I resisted going through the entire list, but you've done a very good job of responding and we'll be putting a few other questions for you into the record.

Ms. MOLER. Thank you, and our employees thank you as well.

Mr. FRELINGHUYSEN. Thank you very much for being here.

[Questions and answers for the record, the prepared statement of Elizabeth Moler, and justifications follow:]

FTE REQUEST FOR FY 1997

Mr. Myers. According to the FY 1997 budget request, actual FTEs for FY 1995 were 1,410 and FTEs for FY 1997 are estimated to be 1,463 -- an increase of 53. Why does FERC plan to increase overall staff levels by over 50 staff despite the Congress' intent to cut staffing in the natural gas and oil pipeline program?

Ms. Moler. Over the past few years we have been carefully managing our staffing levels, reducing where possible -- primarily in the natural gas and oil pipeline program -- in response to the transition to a more competitive marketplace for the natural gas industry. However, bringing competition to an industry requires significantly more work in the initial years, so we knew we would eventually need more staff in the electric area. Rather than hiring large numbers of employees at the outset, we took a conservative approach and waited for the workload to build. The surge of workload hit us in FY 1995 and was far greater than we had foreseen. Furthermore, it has grown larger this year and is expected to grow even more in FY 1997.

During last year's budget hearing, I informed this Subcommittee that rapid changes were taking place in the electric power industry that might influence our staff and funding requirements in the next few years. Since we were then in the early stages of restructuring the electric industry, we could not at that time identify the impact of the changes.

A year later, knowing what transpired in FY 1995 and so far in FY 1996, we have a clearer picture of the magnitude of the electric power workload increase. The workload has been exploding -- in FY 1996 we expect receipts to be three times the number received in 1991. Based on these considerations and our experience gained from the natural gas effort over the past three or four years, we feel the increase requested for the electric power program is supported by the workload demands in that area.

ELECTRIC MEGA-NOPR

Mr. Myers. The Commission has invested considerable time and energy in its "mega-NOPR" -- the notice of proposed rulemaking on open access in the electric utility industry. Please describe the regulatory process in respect to this proposed rulemaking. What is the current procedural status of the rulemaking? Briefly describe what the Commission is hoping to accomplish with this effort and feel free to remark on the Commission's views regarding emerging competition in the electric utility industry. What measurements will be used to ensure that consumers benefit from these changes? What are the current expectations for these measurements? When do you expect to issue a final rule?

Ms. Moler. We issued the NOPR on March 29, 1995. Comments were filed by August 7, 1995 and reply comments by October 4, 1995. We are analyzing the more than 20,000 pages of comments that we received from about 400 commenters and the information that we received from industry participants at several technical conferences. These technical conferences addressed ancillary services, the pro forma tariffs, power pools, and independent transmission system operators. We are in the process of refining the proposed rules and pro forma tariffs to reflect the results of our analysis. The Commission will issue a Final Rule in the very near future.

The Commission's goal is to encourage lower electricity rates for consumers by structuring an orderly transition to competitive bulk power markets. As we explained in the NOPR:

> The electric power industry is today an industry in transition. In response to changes in the law, technology, and markets, competitive pressures are steadily building in the industry. Once the primary domain of large, vertically integrated utilities providing power at regulated rates, the industry now includes companies selling "unbundled" power at rates set by competitive markets. New generating facilities are being built at costs well below the average costs of some vertically integrated utilities. In this environment, more competition will mean lower rates for wholesale customers and, ultimately, for consumers.

After public utilities file open access tariffs in compliance with a Final Rule, we will continue to carry out our responsibility under the Federal Power Act to ensure that all rates and charges by public utilities for the transmission or sale of electric energy at wholesale in interstate commerce are just and reasonable and that there is no undue discrimination in the provision of jurisdictional services.

The Commission expects that consumers will benefit substantially from competition in the electricity industry. The Commission's proposed rule would create non-discriminatory open access transmission access that will facilitate competition in power markets. We expect that the benefits from competition will be $3.75 to $5.5 billion dollars per year. These estimated benefits were derived in staff's Draft Environmental Impact Statement and are based on projected savings in operations and maintenance expenses, and improved trading in short-term markets. We expect that potential improvements in technology (such as quick response generation and electronic transmission switching) could be another source of important consumer benefits, but staff was not able to estimate the likely cost savings. For the most part, we expect that competition will ensure that these future cost savings are converted into consumer benefits, although regulation (at both the state and federal levels) will result in the pass-through of these savings in the interim before competition is fully effective.

STATE/FEDERAL ISSUES

Mr. Myers. What specific problems are foreseen as states develop new approaches to power markets? Are there pending or imminent problems currently between states and FERC?

Ms. Moler. I believe that the Commission has authority under existing law, specifically the Federal Power Act and the Energy Policy Act, to take steps to enhance competition in the existing wholesale power markets and to accommodate states that are interested in instituting a retail wheeling program. In our Final Rule on Open Access, to be issued soon, we intend to establish a framework under the existing law that will meet both of these objectives.

Even so, Congress should consider legislation that would make competition, open access, and appropriate stranded cost recovery mechanisms even easier to achieve. At present, the most significant problem is an ambiguity in current law that, if left unresolved, could hamper state efforts to promote competitive power markets. As I testified before the Senate Committee on Energy and Natural Resources on March 6, 1996, section 212(h) of the Federal Power Act makes it clear that the FERC does not have authority to order transmission directly to an ultimate consumer. This is also known as retail wheeling. Some argue that this prohibition on FERC-ordered retail wheeling does not, however, pave the way for states to order retail wheeling. They argue that the Federal Power Act preempts the field, and that therefore no one has authority to mandate retail access.

I believe that a state's ability to act should not be clouded by such a federal field preemption argument. Legislation clarifying that states are, in fact, able to order retail wheeling would free the states from uncertainty. It would also avoid years of costly and wasteful litigation. However, in any such legislation, it should be made clear that the FERC would still set rates, terms and conditions of transmission in interstate commerce by public utilities.

Another area of uncertainty between the states and FERC goes to the jurisdictional dividing line between the states' authority and the FERC's authority. Historically, because most sales of power and transmission service have been "bundled" together in one "sale", it has been relatively easy to figure out where state authority ends and federal authority begins. Basically, the FERC regulates wholesale bundled sales and the states regulate retail bundled sales. That remains the case for most transactions today. However, a key feature of many proposals at both the federal and state level is "unbundling", which means that transmission service is available and sold separately from a power sale. Customers will be able to buy their power and their transmission service in separate transactions, and customers will be able to shop for power from among alternative power suppliers.

When this happens, the jurisdictional dividing line between a state and the FERC changes from the bundled wholesale sales vs. bundled retail sales distinction I just mentioned. The Federal Power Act clearly gives the FERC exclusive jurisdiction over rates, terms and conditions of transmission in interstate commerce by public utilities -- up to the point of "local distribution." Thus, in an unbundled world, the dividing line between state and federal authority to regulate is determined by figuring out where such transmission ends and local distribution begins.

There is a lot of uncertainty about where to draw this critical line. States have asked us to draw this line to ensure that they can still deal effectively with stranded costs and stranded benefits. States also wish to maintain their ability to deal with other matters of local concern without the threat of federal intrusion.

I fully expect that the FERC will be very respectful of state concerns so long as they do not balkanize interstate transmission of power or conflict with the FERC's open access policies. And, I certainly see no reason why such a conflict needs to arise. However, I do believe that the basic premise of the Federal Power Act is correct: the FERC should continue to regulate rates, terms and conditions of transmission in interstate commerce by public utilities. That is critical if we are to provide the Nation with a fair and open transmission grid through which power can be traded reliably and efficiently. Consequently, when unbundled transmission occurs, it should be pursuant to a FERC approved tariff that meets these national policy objectives.

Finally, there is the issue of stranded costs. These are the costs that potentially could go unrecovered if customers are able to use wholesale or retail open access transmission to leave their existing suppliers' systems to buy power elsewhere, before paying all the costs that were incurred on their behalf by their existing suppliers. It has been the Commission's view that retail stranded costs are the states' to deal with, unless state regulators lack authority to address the problem.

I believe that if retail access goes forward within the current statutory framework, retail stranded cost recovery should remain a state responsibility. However, there is a very real possibility that some state regulators may lack authority to provide for stranded cost recovery. In that instance, it is my view that federal authority should be available to provide for recovery of stranded costs. Public utilities have invested billions of dollars in providing reliable service. They should be provided an opportunity to recover prudently incurred costs as the electric industry changes to a new way of doing business.

STRANDED COSTS

Mr. Myers. What is FERC's estimate of the total cost of stranded costs?

Ms. Moler. Estimates of the potential level of stranded costs vary widely. In our June 29, 1994, Notice of Proposed Rulemaking on the recovery of stranded costs, the Commission noted estimates ranging from tens of billions of dollars to $200 billion or more. In comments, Edison Electric Institute (EEI) said that the magnitude of potential stranded costs is in the upper range of the NOPR's $50 to $200 billion estimate. EEI's comments also noted that the level of potential stranded costs could well exceed the book value of equity of many utilities. Other commenters argued that the estimates are exaggerated.

Last year, the Commission issued a Supplemental NOPR on stranded costs as part of its rulemaking on open transmission access. Comments in that proceeding refer to a Resource Data International study that shows that of $114 billion in potential investor-owned utility stranded investment, only a potential $10.4 billion is associated with FERC wholesale transactions. Other comments refer to a report by Moody's Investor Service estimating that the stranded costs of the Nation's 114 largest electric utilities under open access transmission for both wholesale and retail will be $135 billion in the next ten years (13 to 14 times greater than the costs stranded by the introduction of open access transportation of natural gas). The cost estimates in such studies can vary significantly depending on, among other things, what costs are considered stranded, the underlying assumptions on the future market price of replacement power and the percentage of electric sales considered to be wholesale transactions subject to FERC jurisdiction.

With respect to our jurisdictional responsibility, we estimate the percentage of energy sales associated with wholesale stranded costs to be between nine and thirteen percent. However, in the Open Access and Stranded Costs NOPR, we indicate our intention to provide for recovery of stranded costs associated with retail-turned-wholesale customers (e.g., municipalization) or stranded costs caused by retail wheeling if the state regulatory commission lacks the legal authority to address stranded costs.

Mr. Myers. Are stranded costs included in the cost savings projections showing $3.8 billion to $5.5 billion in annual savings attributed to the open access program?

Ms. Moler. The estimated savings contained in the Draft Environmental Impact Statement (DEIS) in the Open Access and Stranded Costs NOPR are not dependent on any level of assumed stranded cost recovery. Since stranded costs by their very nature have already been incurred by the utilities and are already in utilities' rates, recovery (as provided for in the

proposed rule) merely continues the status quo (i.e., the recovery of utilities' current costs of providing service). As we stated in the DEIS, stranded cost recovery does not affect the underlying economics supporting future decisions to run, make capital investments in, or to shut down plants. The rationale for allowing recovery was to not endanger the financial standing of this capital intensive industry during the transition to competitive electric markets.

Mr. Myers. It has been proposed that utilities receive 100% "recovery." Please provide details of other alternatives that were examined.

Ms. Moler. We propose to allow utilities an opportunity to recover 100 percent of their verifiable, prudently-incurred stranded costs. Stranded costs are costs incurred under the old, regulated monopoly regime that a company could not collect in a competitive environment. The comments in the stranded cost proceeding offered a panoply of options from no recovery to essentially a guaranteed recovery for all assets and costs. Intermediate proposals include exclusion of a portion of rate of return-related revenues associated with stranded assets. We considered all of the comments. Any reduced recovery from customers, however, would require shareholders to absorb some stranded costs. Because the significance of such costs to utilities that would face them and the prospect of not recovering such costs could erode utilities' ability to attract capital and be detrimental to shareholders, we allow the full recovery alternative.

Mr. Myers. What challenges does the FERC face in determining the amount of stranded costs for a particular utility?

Ms. Moler. Many considerations will come into play. For example, under the stranded cost recovery mechanism contained in our NOPR, to decide the amount of wholesale stranded costs a utility will be required to show that it had a "reasonable expectation" of continuing to serve the affected wholesale customers beyond the term of the wholesale contracts. This will require a case-by-case analysis of existing contracts and business relationships for those wholesale customers that decide to cease being requirements customers and become transmission customers. Additionally, the amount of the stranded costs will have to be estimated. As proposed in the NOPR, this will require the use of an approach using the anticipated wholesale revenues and presumably the period the reasonable expectation would last. Another consideration will be the future competitive market value of electricity. This amount will have to be determined since the market value establishes the amount of costs that are stranded.

Mr. Myers. What are the incentives for utilities to minimize or absorb a portion of their stranded costs?

Ms. Moler. We anticipate that many stranded costs disputes will focus on the issue of whether a utility did or did not have a "reasonable expectation" of continuing to serve a particular wholesale customer beyond the term of its contract. We are confident that many of these disputes will be negotiated and settled between the parties. Although the Commission proposes to permit the opportunity to recover 100 percent of stranded costs, other factors will be providing incentives to keep costs to a minimum in more competitive markets. Examples of these factors include the requirement to absorb other uneconomic assets, the fact that a utility may not be able to prove "reasonable expectations," the need to get costs down to compete and the increased pressure to foster and maintain customer good will.

STAFFING LEVELS

Mr. Myers. In the FY 1996 conference report, Congress recognized the need to maintain current staff levels in the electric power program to respond to a significant short-term workload increase related to restructuring. In FY 1996, FERC's estimated staff level for electric power is 414 -- up from 346 in FY 1995 -- and FERC is requesting 486 staff for FY 1997 -- an overall increase of 140 staff from the FY 1995 level. Why is FERC increasing its staff in this area despite Congress' wishes to keep those expenditures relatively constant?

Ms. Moler. The increase in staff needs is due entirely to the tremendous increase in workload we are experiencing in the electric power program area. In reading the conference report, we understood that the conferees recognized the need to maintain the current staffing level of 1,453 to meet the increasing electric power workload, even as we decreased in natural gas. We did not read the language to mean that the electric program itself should stay constant. Although our FY 1997 request for 1,463 FTEs is higher than our FY 1995 level, it is, in fact, 72 positions lower than our authorized level in FY 1992, the year Order No. 636 was issued and the Energy Policy Act was passed. Following enactment of the Energy Policy Act of 1992, electric power compliance and rate filings nearly tripled (from 770 to 2,165) from FY 1991 to FY 1995 and are expected to more than quadruple (to 3,500) by FY 1996. We included a chart on page 4 of our budget request that demonstrates the huge increases in workload.

Mr. Myers. Please outline your plans for bringing staffing in that area and FERC's overall staffing levels more in line with Congress' expectations expressed in the FY 1996 conference report.

Ms. Moler. In the conference report, the conferees recognized the value of maintaining the current staffing level to respond to the significant increase in workload in the electric power program. They also encouraged us to use additional

authority from prior years' unexpended balances, as needed, to mitigate the recommended funding reduction, which reinforced the idea that overall staffing would not be reduced. The requested level of staffing is essential to allow the Commission to meet the goals and schedule that we and the industry have set for restructuring.

Simply put, we need additional resources to deal with the avalanche of cases spurred by electric industry restructuring. I believe it would be counter productive for the Commission to be unable to implement open access and to deal with industry restructuring issues due to a lack of staff resources. The consumer benefits are tremendous and certainly worth a small investment in staff resources necessary to achieve the results.

Eventually, we expect the results of restructuring to reduce the Commission's electric workload. When that happens, we anticipate electric program staffing needs will decrease as well.

INTERNET-BASED INFORMATION SYSTEM

Mr. Myers. What is the estimated cost of the new Internet-based information system? Will this information be made available to the public?

Ms. Moler. In the Commission's notice of proposed rulemaking governing the formation of Real-Time Information Networks and Standards of Conduct, the Commission provided an estimate of the costs associated with compliance with the proposed transmission information requirements. It estimated that the average annualized cost per respondent of compliance would be $810,000 -- $190,000 for annualized capital/startup costs and $620,000 for annualized operations and maintenance costs. No party filing comments on the proposed rulemaking has challenged the aggregate cost estimate (though comments have been filed as to the number of entities that are responsible for the costs of compliance with the rulemaking). Since then, we have revised our estimates. We now believe that the average annualized cost per respondent would be $759,000 -- $190,000 for annualized capital/startup costs and $569,000 for annualized operation and maintenance costs. In this regard, the Commission also proposed that transmission-owning public utilities will be entitled to recover all reasonable expenses associated with developing and running the proposed transmission information network, by rolling in these costs into wholesale transmission rates or by charging usage fees to individual customers.

In addition, the Commission provided for public access to transmission service information through access to information networks established on the Internet. To alleviate security and system integrity concerns, the Commission proposed that once members of the general public (as well as Commission Staff) satisfy the requisite registration procedures, they be granted "read only" access to the transmission information network.

PRO FORMA TARIFFS

Mr. Myers. Please explain how the "pro-forma" tariff approach will be implemented.

Ms. Moler. The NOPR pro forma tariffs contain the proposed minimally acceptable terms and conditions of service for interstate transmission services. They contain non-price terms and conditions that assure acceptable levels of service quality for all transmission users. In the NOPR, the Commission proposed that all transmission-owning public utilities that do not have non-discriminatory open access transmission tariffs on file on the effective date of the Final Rule would be required to follow a two-stage process.

In Stage One, the Commission would put into effect tariffs for network, point-to-point, and ancillary transmission services. These tariffs would specify the minimum terms and conditions of service needed to eliminate undue discrimination, and would become effective 60 days after the effective date of the Final Rule. Because the proposed pro forma tariffs do not contain specific rates, the Commission itself proposed to establish, for each affected public utility, just and reasonable rates for network service, point-to-point service, and six identified ancillary services. These rates would be incorporated into each utility's tariffs.

In Stage Two, which would begin 61 days after the effective date of the Final Rule, parties would be allowed to propose changes to the rates, terms, and conditions for service under utilities' transmission tariffs pursuant to sections 205 and 206 of the Federal Power Act, but such changes would have to be consistent with the substantive requirements of the Final Rule.

The Commission received extensive comment on these proposals. All of these matters are under consideration as the Commission develops its Final Rule.

NATURAL GAS RESTRUCTURING ORDER NO. 636

Mr. Myers. FERC Order No. 636 continues the evolution of the natural gas industry to a more open and accessible pipeline system. The Order enables local distribution companies and end users to buy natural gas from any competing suppliers, including gas lines. What measurable benefits have consumers enjoyed?

Ms. Moler. Since the Commission started its open access policies in 1985, end-use prices have decreased. Post Order No. 636, consumers of all classes are enjoying additional savings. These savings are due to decreases in the real price of natural gas. One estimate of these savings is calculated as the difference in the real cost of natural gas to consumers between 1995 and other years. I will provide for the record a table

showing the savings that accumulated due to real price differences between 1993 and 1995, the post-636 period.

(The information follows in Table 1:)

Table 1
Savings to Consumers in 1995 based on 1993 Real Prices

Consumer Class	1995 Quantity (Bcf) Delivered	1993 Real Price Differential**	Estimated Savings - Billions of $
Residential	4844	0.38	1.84
Commercial	3096	0.45	1.39
Industrial	8520	0.55	4.69
Elec Utility	3194	0.72	2.30
Total Savings			10.22

**Prices measured as $/Mcf, adjusted for inflation (GDP deflator 1995=100). The price differential is Real Price 1993 less 1995 Price. Source: Energy Information Administration (EIA).

Natural gas prices to all consumers (residential, commercial, industrial and electric utilities) have declined in real terms. I will provide for the record a second table which demonstrates this decline comparing 1993 and 1995.

(The information follows in Table 2:)

Table 2
Percentage Decreases in Real Prices, 1993 - 1995

Consumer Class	1993 Real Price*	1995 Price	Percent Decrease
Residential	6.44	6.06	5.9
Commercial	5.46	5.01	8.2
Industrial	3.21	2.66	17.1
Elec Utility	2.73	2.01	26.4

*Prices measured as $/Mcf, adjusted for inflation (GDP deflator 1995=100). Source: EIA.

Order No. 636 has had a positive environmental effect. This effect is measured by coal and natural gas usage in electric utilities. Since natural gas does not contribute to acid rain problems, increased use of natural gas has a positive environmental effect if it displaces use of coal in electric utilities. Since Order No. 636, the rate of increase in coal usage in electric utilities has declined. From 1985 to 1992, the pre-636 period, coal usage in electric utilities increased 12.4 percent, or 2.4 percent on an annual basis. From 1993 to 1995, the post-636 period, coal usage increased 1.9 percent, or 0.4 percent on an annual basis. Natural gas usage by electric utilities has shown the opposite trend. From 1985 to 1992, natural gas usage by electric utilities was declining by almost 2 percent on an annual basis. From 1993 to 1995, natural gas usage increased 19.1 percent, or 3.6 percent on an annual basis. In fact, natural gas usage in 1995 was greater than natural gas usage in 1985.

The natural gas industry has also seen an increase in the percentage of unbundled sales made to commercial and industrial customers. In 1995, unbundled sales to commercial customers was about 29.7 percent compared to 16.1 percent in 1993, and 13.4 percent in 1990.

MARKET-BASED RATES

Mr. Myers. What is the status of the market-based vs. cost-of-service review?

Ms. Moler. On January 31, 1996, the Commission issued a policy statement on alternatives to traditional cost-of-service ratemaking which set criteria for evaluating market-based rate proposals by natural gas pipelines. In addition, the policy statement modified existing policy on incentive rates, and expressed the Commission's willingness to accept requests by pipelines to negotiate rate terms as long as a recourse rate is available to customers.

The policy statement established three steps the Commission will take in analyzing whether pipelines lack market power and therefore can charge market-based rates. The Commission will: (1) define the relevant markets; (2) measure a firm's market share and market concentration; and (3) evaluate other relevant factors.

In modifying the Commission's existing policy on incentive rates, the policy statement eliminated two of the standards the Commission would have applied in evaluating specific incentive proposals. Under the revised standards, incentive rate proposals must be: (1) prospective, (2) voluntary, and (3) understandable; and pipelines must share any efficiency gains of the program with their ratepayers. Eliminated were requirements that pipelines quantify the benefits of the program and that rates under

incentive regulation be no higher than they would have been under traditional cost-of-service regulation.

Finally, the policy statement expressed the Commission's willingness to evaluate, on a shipper-by-shipper basis, requests to implement negotiated rates where customers retain the ability to choose a cost-of-service based tariff rate as a recourse. The Commission stated it was not willing to permit negotiated terms and conditions of service at this time without industry comment and established a new proceeding soliciting comments on whether the Commission should permit negotiated terms and conditions of service.

The Commission intends to address specific concerns about the policy statement in responding to the pipelines' filings to implement alternative rate proposals.

On February 23, 1996, the Commission granted clarification that it would accept any comments that were relevant to the issue of whether it should permit negotiated services, including relevant rate issues. Comments on negotiated services have just been filed.

NATURAL GAS AND OIL PIPELINE PROGRAM FUNDING

Mr. Myers. At the end of FY 1993 FERC eliminated its producer regulation program, which in FY 1992 expended $3 million. The rate filings received have dropped from 9,304 cases in FY 1994 to an estimated 2,239 cases in FY 1997. At the same time, budget expenditures for the natural gas and oil pipelines area stayed relatively constant from a pre-Order 636 level of $60.4 million for FY 1991 to a planned level of $59.8 million for FY 1997. Please provide earlier estimates for cost-saving and an explanation for the continued level of funding.

Ms. Moler. First, I would like to point out that although rate filings dropped by more than 7,000 filings from FY 1994 to FY 1997, the drop is almost entirely due to the termination of the reporting requirement for self-implementing transactions under section 284, known as transportation transactions, which took less than three FTEs to maintain. These reports contained information on individual pipeline transportation transactions which was retained for general public availability. The pertinent information from these reports is now obtained electronically, resulting in a significant burden reduction for both the pipelines and the Commission.

In addition, even though the funding for the natural gas and oil pipeline program is approximately the same for FY 1991 and FY 1997, making a direct one-to-one comparison between the two years is misleading.

While we have reduced program staffing by 28 percent (from 737 to 533 FTEs) between FY 1991 and FY 1997, factors like

inflation, mandated pay raises, and, recently, locality pay adjustments have acted as offsets to the staffing reductions. For example, if the average salary for the natural gas and oil pipelines program had stayed the same since FY 1991, funding for this program in FY 1997 would be under $50 million.

I also want to point out that the gas and oil program comprises a smaller portion of our total budget requirements than ever before. From FY 1991 to FY 1997, the cost of the program declined from 50 percent to 36 percent of the Commission's total budget. Furthermore, the level of funding for this program is budgeted to decrease in both FY 1996 and FY 1997: in FY 1997 it is about 15 percent less than we spent in FY 1995. The cuts that Congress has already made are as far as I believe we can go without building a new case backlog and still maintain the primary functions and objectives of the program. Even at this level, we anticipate increases in pending workload in some areas as we give priority to cases with statutorily imposed deadlines.

Mr. Myers. In FY 1995 there were 609 FTEs in the natural gas and oil pipeline area. FERC's FY 1997 budget request shows that it plans to use 585 FTEs for FY 1996 and 533 for FY 1997. In the FY 1995 conference report, Congress recommended a 20% reduction in staff over the next two years, which would result in a staff allocation of 487. Why has FERC been so slow to respond to the conference report's recommendation?

Ms. Moler. I don't agree that we have been "slow to respond." In fact, we are slightly ahead of our plan to meet the Congress' directive to reduce in this area by the end of FY 1997. We calculated the 20 percent reduction from the authorized ceiling of 666 FTEs for FY 1995. That was the number of FTEs authorized for the program area when we were instructed by the conference report to make the 20 percent cut. A 20 percent reduction from this level over two years — FY 1996 and FY 1997 — results in 533 FTEs in FY 1997 (666 - 20 percent = 533).

Before Congress required the 20 percent program cut, I had already taken actions internally to cut the size of the staff in recognition of the decreasing caseload and need to use the resources in the electric power program area. We began these reductions in FY 1995. By the end of that year we had already reduced the actual use of FTEs to 609. This actual level is reflected on page 12 of our current budget request. We expect to reach our interim goal of 585 FTEs in FY 1996.

It is important to point out that in FY 1994 we needed and used 664 FTEs in our natural gas and oil pipelines program. Our original projection for FY 1995 came to 666 FTEs; we were able to reduce this number to 609 during the year. To decrease this program further by applying the 20 percent to a new base — the actual usage of 609 FTEs at the end of FY 1995, rather than the 666 current at the time of the conference report — nullifies the

progress we made during FY 1995 in responding not slowly, but perhaps too quickly, to the conference report's recommendation.

HYDRO RELICENSING PROGRAM

Mr. Myers. FERC had a dramatic workload increase last year in the hydro power area because FERC had to relicense 157 projects whose licenses had expired in 1993. FERC's FY 1997 budget request does not show much reduction. What is the status of this bubble in processing renewals?

Ms. Moler. The Commission has taken action on 84 of the 157 relicense applications for projects whose licenses expired in 1993, the "Class of '93." Of that group, we have issued 82 new licenses. In addition, for the remaining 73 applications, we have issued draft or final environmental documents for all but a handful. In some of those cases, we have deferred processing at the request of the parties to accommodate settlement discussions, and in others, we must wait for action by other federal agencies or by state agencies. I am optimistic that we will take final action on the great majority of the remaining Class of '93 relicense applications this year.

Mr. Myers. When can we expect to see a decline in staff in the hydro program commensurate with the dramatic decrease in relicensing workload for that area? Do you envision such a decline will result in a commensurate decline in overall agency staff?

Ms. Moler. As processing of the pending relicensing work is completed, we will implement an appropriate realignment and reduction of the licensing staff. These actions will contribute to a reduction in the total Commission staff working in the hydropower program. This reduction, however, will not be entirely consistent with the decline in relicensing work, for several reasons. As an example, the issuance of the large number of Class of '93 new licenses, with many new environmental protection and mitigation measures, is creating additional post-licensing work in the license administration and dam safety program areas. Besides the need for long-term monitoring of greater numbers of license terms and conditions, administrative and technical staff are devoting more time to helping new licensees understand and carry out the provisions of their licenses. We will shift some staff from licensing to post-licensing to address this growth in workload.

Myers. Do you anticipate any additional surges of relicensing applications in the near future?

Ms. Moler. Although original license filings are not expected to grow in the next several years, there will be a new surge of relicense applications in 1998 and 1999, when 69 applications are scheduled to be filed. These relicense applications will present a host of difficult issues; they also

will be for larger projects whose total capacity will exceed the capacity of the Class of '93 projects by 25 percent. At the request of interested stakeholders and potential applicants, the Commission's staff is already working with them on pre-filing activities for a growing number of future applications. These activities include applicant-prepared environmental assessments and third-party-contracted environmental impact statements provided for in the Energy Policy Act of 1992. This level of demand on staff resources before application submission did not exist for the Class of '93 applications, and represents a new workload for the licensing staff. This change is reflected in the Commission's current consideration of a petition for a rulemaking, submitted by the National Hydropower Association, that calls for procedures to formalize staff's pre-filing activities.

LAKE GASTON PROTECTION ACT

Mr. Myers. Toward the end of the last session of Congress, H.R. 2648 was introduced in the House of Representatives by Rep. Funderburk. That legislation, the Lake Gaston Protection Act of 1995, is designed to require the FERC to obtain certification from the State of North Carolina that a particular water pipeline project will have no adverse effect on the environment or the economy of that State. Such certification would be required retroactively as the condition for the issuance of a license for the project, which involves the withdrawal of water from Lake Gaston. Does the FERC have a position on this legislation? How does the Commission respond to the charge that, in approving a permit allowing the daily withdrawal of sixty million gallons of water from Lake Gaston, FERC officials failed to examine the potential negative environmental effects of such withdrawal. Does the Commission agree with proponents of the legislation that operation of the project would be harmful to estuaries and commercial and recreational fishing industries? Is it true, as North Carolina officials assert, that FERC staff failed to conduct studies requested by several federal agencies, including the Environmental Protection Agency, U.S. Fish and Wildlife Service and the National Marine Fisheries Service?

Ms. Moler. The Commission does not have a position with respect to H.R. 2648.

On July 26, 1995 the Commission granted a request by Virginia Electric Power Company, licensee for the Lake Gaston Project, to amend the Lake Gaston license to allow withdrawal of up to 60 million gallons of water per day from the Lake Gaston reservoir for the purpose of municipal water supply for Virginia Beach, Virginia. Before approving the license amendment, the Commission conducted a very thorough analysis of the impact of the project. Federal and state (both Virginia and North Carolina) resource agencies participated extensively in the Commission's proceeding.

Pursuant to the requirements of the Federal Power Act and the National Environmental Policy Act (NEPA), the Commission exhaustively analyzed the potential environmental effects of the withdrawal of water from Lake Gaston and the alternatives to that proposal. These data, analyses and conclusions are contained in the Commission's Final Environmental Impact Statement (FEIS), which was issued on July 7, 1995. The FEIS describes the effect of the water withdrawal on the five geographic areas of potential impact: (1) the project reservoir and its surrounding area; (2) the Roanoke River and its surrounding area downstream from Lake Gaston; (3) the Roanoke River and its surrounding area upstream from Lake Gaston; (4) the water pipeline and its surrounding corridor; and (5) the area where the water pipeline terminates.

The FEIS includes a comprehensive analysis of the potential impacts of the water withdrawal on the estuarine portion of the Roanoke River. This area includes the lower Roanoke River downstream of the Roanoke Rapids Dam and Albermarle Sound. The FEIS concluded that the only effect the project will have on the lower Roanoke River is to reduce the average annual flow of the river by approximately one percent (93 cubic feet per second). The FEIS further concluded that the water withdrawal will not significantly affect striped bass spawning success or resident fish in the lower Roanoke River. The FEIS also concluded that the water withdrawal will not affect whatever water quality that may currently exist in the lower basin. Finally, the FEIS concluded that the water withdrawal will not significantly affect downstream wetlands. Therefore, the water withdrawal will not affect the estuary and commercial and recreational fishing industries.

The FEIS used what is known as the "HEC-5" model to determine whether the project would have any flow impacts. The results of the model indicated that the water withdrawal will have no effect on minimum flows, no effect on flows during striped bass spawning, and no significant effects during the remainder of the year. Therefore, the additional studies suggested by various agencies and scientists were unnecessary.

The Commission's staff used the most recent data available for all of its analyses. The staff performed many new analyses regarding surface flow modeling, fish and wildlife impacts, water quality, alternative water sources, energy demands, population estimation, and consumptive water use. In summary, the FEIS thoroughly analyzed and addressed all of the potential effects of the water pipeline project.

Certain parties have appealed the Commission's decision to the Court of Appeals for the District of Columbia Circuit.

NEW HEADQUARTERS BUILDING

Mr. Myers. In 1995, FERC's Washington staff moved into its new building near Union Station. GAO has estimated that current

staffing projections show 94 fewer staff than anticipated when the lease was signed. Further staff reductions should be seen in the near future. The annual lease cost is about $16.2 million which equates to about $1.5 million for each of the 11 floors FERC uses in the new building. GAO estimates that the lower staff level would allow FERC to free up about $1 million in leased space. What actions has FERC taken or does it plan to take to reduce its lease costs?

Ms. Moler. I am sure this is a question the General Services Administration (GSA), our federal landlord, is facing more and more in these times of Government downsizing and streamlining. GSA entered into a binding 20-year lease with the building owner for the Commission's new headquarters. Under the terms of this agreement, if FERC no longer needs the entire building, GSA must provide another federal lessee. We certainly would have no objection to another agency using any extra space we have. As we reduce our staffing levels (both federal employees and contractors) and, hence, our space needs, we will work with GSA to try to release space to fulfill other agencies' requirements.

Mr. Myers. What potential exists for FERC to use its overall space more efficiently by consolidating its staff and possibly surrendering even more space to create more savings?

Ms. Moler. As you know, we've just moved into our new headquarters location. We are still adjusting to the new facility and its contrast to our old buildings, two of which did not even meet fire and safety codes and were in desperate need of extensive renovations. For the present, I believe we were very conscientious during our design phase to maximize efficient space usage. And, in the future, we will continue to look for ways to use space more efficiently.

CONTRACTORS' USE OF FERC BUILDING SPACE

Mr. Myers. One hundred and forty-four (144) contractors would equate to the use of about one floor in FERC building and about $1.5 million in lease cost. Does FERC have an arrangement with contractors to recoup the lease cost FERC incurs for space and the cost for equipment the contractors use?

Ms. Moler. We do not recover the lease or equipment costs from our contractors who work on-site. Having contractor employees work on-site is to the net benefit of the Government. Our contracts contain a standard clause which states that the Government, in this case FERC, will provide space and furnishings at no cost to the contractor for their employees who work on-site. If the contractor performed the work off-site, the Government would have to pay a higher rate which would include the contractor's cost to house and support those employees.

Mr. Myers. Are there any restrictions in FERC's lease that would limit its ability to turn-back space to GSA for leasing to other agencies and create savings to the regulated industries? If so, what are they?

Ms. Moler. Any restrictions apply to GSA in that they entered into a binding 20-year lease with the building owner. We pay rent to GSA based on their space rental charges. We have no control over what they charge us except for the amount of space we occupy. If GSA determined we need less space and they allocated less space to us, for the purpose of leasing the space to another agency, our rent would be adjusted accordingly and the savings would be passed on to the regulated industries.

CARRYOVER OF UNOBLIGATED BALANCES

Mr. Myers. FERC entered Fiscal Years 1995 and 1996 with $30.5 and $33.2 million, respectively, in unobligated carryover funds. FERC's FY 1996 request for new budget authority was reduced $20.3 million from $151.6 million to $131.3 million. FERC informed GAO that it plans to enter FY 1997 with carryover funds of $5 million and has a goal to reduce its carryover balance to zero by the beginning of FY 1998. What do you believe should be FERC's unobligated carryover balance? If not zero, what do you believe is the appropriate amount for FERC and why?

Ms. Moler. We applied carryover of $28.2 million to our FY 1996 budget request, and in applying $5 million to our FY 1997 request, we are making every effort to reduce our carryover to zero by the end of FY 1997. When discernable growth in carryover became evident in FY 1994, we responded immediately by devising a plan to reduce and/or eliminate our prior years' unobligated balance. That year, we requested a dramatic reduction in new budget authority for FY 1996 in order to use the majority of the carryover funds, and plan to use the balance in FY 1997.

I do not believe sound financial planning should include expectations of having zero dollars in unobligated balances. However, it is also unreasonable to expect that every available dollar will be obligated in light of delays encountered in the procurement process and a host of other factors. Prior to FY 1994, the Commission traditionally carried forward less than $5 million in prior years' unobligated authority. I believe a balance of this amount is both reasonable and manageable.

Mr. Myers. Please provide the subcommittee with a detailed summary on how FERC's unobligated carryover escalated from $2.8 million at the beginning of FY 1991 to $33.2 million at the beginning of FY 1996 and how, on a line-by-line basis, FERC plans to reduce those funds to zero.

Ms. Moler. The unobligated carryover occurred primarily in FY 1994 and FY 1995 in the areas of personnel compensation, automation, and delayed procurement actions.

In these years, we budgeted for pay raises in accordance with OMB guidance and were appropriated these funds. Subsequent to each appropriation, however, the general pay raise was either canceled or significantly reduced, resulting in large unexpected savings. Also, in support of the Administration's goal to reduce the federal employment level, we held the line on staffing for as long as we could. With the unprecedented growth in electric power program workload, of course, staffing will be significantly increased.

Additionally, we were in the process of converting to a more efficient LAN environment. We budgeted to support this conversion; however, by the time we began purchasing the required hardware, prices had dropped — in line with economics of the computer industry — thus reducing our costs.

Finally, in FY 1995, we had some unavoidable delays in environmental work and ADP equipment purchases. We expect these obligations to take place in FY 1996.

We applied $28.2 million of the unobligated carryover to our FY 1996 funding plan, and the final $5 million to our FY 1997 plan. We did not formulate our FY 1996 budget request by applying our unobligated carryover to specific accounts or programs. Rather, we first identified the full operating needs for our programs and then applied $15 million from unobligated carryover against the total operating requirements.

We were extremely conservative in our FY 1996 request, keeping it as low as practicable despite uncertainties in some areas. As these uncertainties materialized, we applied additional unobligated balances to cover these needs. For instance, the need for first-quarter rent on our three old buildings was unclear at the time of our request; it later became necessary to fund this rent of $1.7 million.

We also increased the use of carryover funds because of delayed FY 1995 procurement actions totalling $6.2 million, which will be obligated in FY 1996.

Finally, Congress reduced our FY 1996 funding request by $5.3 million in accordance with the recommended 20 percent staffing reduction in the natural gas and oil pipelines program, as noted in the FY 1996 conference report. However, the conference report suggested that we mitigate the impact of the funding reduction as needed, by employing additional authority from prior years' unobligated balances. We followed this suggestion in the interest of keeping pace with the increased workload in the electric program.

Mr. Myers. What steps is FERC taking to ensure that its appropriation requests are more in line with actual funds needed?

Ms. Moler. It is our policy to base our budget on actual needs, and prior to FY 1994, our unobligated balance was a very small percentage of our budget. We expect to return to this level by the end of FY 1997.

Mr. Myers. Would the energy industries that FERC regulates benefit from paring the $20.3 million in unneeded funds from FERC's budget?

Ms. Moler. First, I'd like to clarify that the $20.3 million does not represent unneeded funds. We are simply proposing to meet some of our needs with funds previously authorized - thereby reducing our request for new budget authority.

Any reduction in our funding requirements is reflected in lower bills to the industries we regulate. Let me assure you, we are committed to using the funds entrusted to us responsibly and passing on to the industries any cost-savings we can.

DOWNSIZING AND STREAMLINING

Mr. Bevill. The electric industry is being increasingly deregulated and competition is increasing. This trend toward deregulation would suggest a potentially lighter workload for FERC; however, your testimony suggests otherwise. Do you agree that savings could be found and, if so, what short and long term plans does FERC have for downsizing and streamlining its operations?

Ms. Moler. As I indicated earlier, I believe it would be counterproductive for the Commission to be unable to implement open access and to deal with industry restructuring issues due to a lack of staff resources. The consumer benefits are tremendous and certainly worth a small investment in staff resources necessary to achieve the results. The Energy Policy Act of 1992 (EPAct), which introduced competition, not deregulation, to the electric power industry, has spawned tremendous growth in electric power program workload -- much greater than we anticipated just a year ago. We expect total FY 1996 electric power program receipts to triple from the level of receipts in FY 1991, and to further increase in FY 1997. Along with these unprecedented increases in traditional workload, we are working to implement an entirely new, nationwide open-access transmission regime. Until FY 1995, we were able to meet the requirements of the EPAct without any additional funding or FTEs. That is no longer possible. Simply put, we need additional resources to deal with the avalanche of cases spurred by electric industry restructuring.

Eventually, open access, competition, and new institutions in the industry should reduce the Commission's electric workload, and electric program staffing needs may decrease from the higher levels that are projected for the next few years. As we

indicated in our budget request, our workload requirements five or more years into the future are still unclear. What is clear is that the electric program needs additional staff and resources now to cope with the current surge in workload and to meet the challenge of fostering a vibrant and fully competitive market for wholesale electricity.

HYDRO RELICENSING PROGRAM

Mr. Bevill. In your testimony, you mention that hydropower relicensing has proven more difficult than expected. What are the major problems you are experiencing and when do you expect to be back on track?

Ms. Moler. Relicensing cases have been delayed for many reasons. The primary reason is that many of these cases are very vigorously contested. This manifests itself in continual disputes between license applicants, resource agencies, and environmental groups over the amount and quality of data needed to support a reasoned decision and the degree to which they believe we should defer to federal and state fish and wildlife agencies. These disagreements also cause delays in obtaining state water quality certification under the Clean Water Act or consistency certification under the Coastal Zone Management Act. Often we need to evaluate complex and sometimes novel legal issues. We also have been very generous in granting extensions of time to accommodate settlement discussions, although the settlement discussions are not always fruitful. Multi-project environmental reviews and the need in many cases to accommodate the schedules of cooperating agencies, some of which have mandatory conditioning authority, further complicate and cause delays in our performing the required NEPA analyses. Notwithstanding these difficulties, we have taken final action on 84 of the 157 Class of '93 relicense applications, and I remain optimistic that we will take final action on the great majority of the remaining relicense applications this year.

DAM SAFETY PROGRAMS

Mr. Bevill. In FERC's opinion, do the Army Corps of Engineers and the Bureau of Reclamation perform satisfactory maintenance on their dams?

Ms. Moler. We are not sufficiently informed about the adequacy of the maintenance programs of the Corps of Engineers or the Bureau of Reclamation to offer an opinion on whether they are satisfactory.

The Federal Emergency Management Agency (FEMA) chairs the Interagency Committee on Dam Safety. FEMA is required to gather information from affected federal agencies -- including the Bureau and the Corps -- on the status of the implementation of the Federal Guidelines for Dam Safety. FEMA then reports the status of the implementation of the Guidelines by federal

agencies to the President and includes the assessment in their "National Dam Safety Program" biennial report. FEMA has found that the Bureau and Corps dam safety programs meet the Guidelines.

Mr. Knollenberg. Please clarify the role of the Federal Energy Regulatory Commission in the area of dam safety. For what aspects of dam safety is your department responsible? How many dams do you inspect each year? How many FTE's does this task require?

Ms. Moler. The Commission's dam safety program applies to approximately 50 percent of the nation's hydropower developments, generally the non-federal projects. We ensure that these licensed and exempted projects are properly constructed, operated, and maintained to protect life, health, and property. In addition to regular inspections by Commission staff before, during, and after construction, we also require periodic inspections and evaluations by independent consulting engineers. We cooperate with other agencies, as appropriate, in conducting this program. Our inspections safeguard the continued operation of projects, which enables them to continue to produce a variety of multipurpose benefits.

In addition to our inspections, we require all licensed projects, unless specifically exempted, to have an emergency action plan in place. These plans provide an early warning system in case of sudden emergencies caused by natural disasters -- such as hurricanes and earthquakes. The plans are tested periodically to ensure maximum public protection at all times.

We are responsible for all aspects of dam safety at licensed and exempted projects, including the structural integrity of all project works, not just the dams. We are responsible for public safety at these projects as well. Extensive recreational opportunities are available at these sites, and the safe use of the projects by the public is an important Commission concern.

Commission staff performs approximately 2,600 inspections of dams and related water retention structures each year. This activity requires about 110 FTE's.

Mr. Knollenberg. How do your efforts in the area of dam safety differ from that of the Bureau of Reclamation and the Army Corps of Engineers? Is there redundancy in our efforts in this area? Can we streamline and improve our collective efficiency?

Ms. Moler. FERC efforts in the area of dam safety are similar to those of the Bureau of Reclamation and the Army Corps of Engineers; however, our responsibilities involve distinctly different parts of the Nation's water resource infrastructure. Under Sections 4(e) and 15 of the Federal Power Act, FERC is authorized to license or relicense non-federal hydroelectric projects. Section 10(c) of the Act requires that licensees

construct, operate, and maintain hydropower projects to protect life, health, and property. The licensee's responsibility is to ensure the safe construction and operation of licensed projects. It is our responsibility to ensure that licensees carry out their responsibilities. The Bureau and the Corps plan, design, construct, operate and maintain their dams for various authorized purposes. When FERC licenses private hydropower development at a Bureau or Corps dam, the federal dam is excluded from the licensed project. We oversee any other non-federal project works and the Bureau or Corps retains the dam safety responsibility.

While there is no overlapping of responsibility or redundancy of day-to-day work, I can report that a great deal of coordination, cooperation, and communication among the federal dam safety organizations already exists.

From our perspective, dam safety coordination with the Bureau and the Corps is conducted efficiently now. I see no areas in which to improve our collective efficiency.

CONTRACTORS FOR SUPPORT SERVICES

Mr. Knollenberg. Does your department utilize support service contractors?

Ms. Moler. Yes, we do. Currently, we use support service contractors in the ADP and telecommunications arena, and for such services as security, mail, warehousing, and the logistics management helpline.

Mr. Knollenberg. If so, are you projecting an increase or decrease in the use of support contractors?

Ms. Moler. This is a tough question to answer, particularly in the area of ADP support. As with most agencies, our contractor level is tied to the number of federal staff they must support, number and types of projects under development, and funding. If any of these factors varies, so does the level of support contractors. At this time, however, I do not anticipate any substantial change in the level of contractors we use.

FEDERAL ENERGY REGULATORY COMMISSION

Elizabeth A. Moler, Chair

FY 1997 Appropriations Hearing

Subcommittee on Energy and Water Development

Committee on Appropriations

U.S. House of Representatives

March 27, 1996

STATEMENT BY
ELIZABETH A. MOLER, CHAIR
FEDERAL ENERGY REGULATORY COMMISSION

BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES

March 27, 1996

Mr. Chairman and Members of the Subcommittee:

It is a pleasure to appear before you today to present the Fiscal Year 1997 budget for the Federal Energy Regulatory Commission.

OVERVIEW

The Commission's Fiscal Year (FY) 1997 request for appropriated funds is $159.4 million, to be supplemented by $5.0 million of unexpended authority from prior years. Together, these funds will meet our FY 1997 full funding requirement of $164.4 million. This full funding requirement has increased by only 3 percent from FY 1996, when it was $159.5 million.

I must caution you against simply comparing our FY 1997 budget request to our FY 1996 appropriation. Such a comparison would misleadingly suggest a larger budget increase than the true 3 percent we request. The FY 1996 appropriation was much lower than our full funding level because we offset it with $28.2 million from prior years' unexpended authority. This was part of a 2-year plan to reduce the Commission's unobligated balance. We expect to have only $5.0 million of carryover remaining at the end of FY 1996, to be applied to FY 1997.

This funding will support a staffing level of 1,463 full-time equivalents (FTEs). This increase of 10 FTEs over FY 1996 is due entirely to our increased work in regulating electric utilities. I would note that our FTE request is 72 fewer positions than we were authorized as recently as FY 1992.

By the end of FY 1997, we will have made the full 20% reduction in natural gas and oil pipeline staff mandated by Congress in the conference report accompanying the FY 1996 Energy and Water Development Appropriations Act. We are also reducing our hydropower staff. All the staffing decreases in the natural gas and hydropower programs will be reallocated to the electric power program, where the workload is skyrocketing as we implement wholesale open transmission access and move toward greater competition. Beginning in FY 1995, the electric program

requirements have simply exceeded our ability to continue without additional resources.

On the financial side, the Commission received a clean bill of health from an independent audit firm for the second straight year. The "unqualified opinion" we received on our FY 1995 financial statements means that the statements accurately reflect our financial position and ensure compliance with applicable laws and regulations and internal controls. I am especially proud of this result, since we have 15% fewer staff in financial management than we had 2 years ago. Our success shows our commitment to use the funds entrusted to us responsibly.

Let me turn to our program areas, starting with electric power.

ELECTRIC POWER

The electric industry is now in the midst of a competitive revolution. I am proud of our work in this national effort to bring competition to the industry. The rule we proposed last March to require non-discriminatory open access to transmission will make competition a reality in wholesale markets. It will provide the indispensable common ground for State efforts of all kinds. We will issue a final rule this spring. For me personally, and for the Commission as a whole, this is a very exciting time.

The principle of nondiscriminatory open access is simple: everyone should have the same access to wholesale markets. Put differently, no generator should gain a competitive advantage through owning transmission. That way, all generators compete evenly to provide service. The result will be lower industry costs and better service for all customers.

We propose to achieve non-discriminatory open access through functional unbundling. Under our open access rule, every transmission owner would be required to separate its transmission function from its generation marketing function. In this way, all customers, including the transmission owner, would gain transmission access under the same terms and conditions.

We recognize that the heart of open access transmission is equal access to information. So, we propose to require transmission providers to set up sophisticated electronic information networks on the Internet that will provide key information on transmission availability to all transmission customers at the same time.

Similarly, we propose to allow utilities to recover 100 percent of their verifiable, prudently-incurred stranded costs.

Stranded costs are costs incurred under the old, regulated monopoly regime that a company could not collect in a competitive environment. Our natural gas experience shows that providing for stranded costs up front is essential to avoid needless delay and contention. I believe we are obligated to give utilities an opportunity for 100 percent recovery. I also believe that it is important not to endanger the financial standing of an industry that is heavily capital intensive and essential to all its customers.

Our proposed rule is already having a major effect on the industry. More and more utilities are filing open access tariffs, even before the final rule goes into effect and requires these tariffs. When we issued the proposed rule, about 20 utilities had some form of open access tariff. We're now over 90. These tariffs cover about 75% of the transmission lines we regulate. In addition to our activities, over 40 states are exploring new approaches to electric utility regulation.

The coming of competition to the electric industry has profound effects on our day-to-day work at the Commission. In the short run, we will face an increase in complex and novel implementation issues. We are trying to decide many issues generically. For example, we will set out model or "pro forma" tariffs. All of the utilities under our jurisdiction will be required to comply with them. That will help make the transition quicker, more orderly, and less burdensome to the industry. Our experience implementing Order No. 636 on the gas side taught us we needed to clearly establish the minimum requirements that the utilities must meet. Nonetheless, many companies will file tariffs to implement their own versions of open access. We have to provide them this flexibility, so they can tailor their programs to meet local needs. This sort of necessary flexibility also means more work for us in responding to all the proposals.

The workload will be enormous. But we are proud of our accomplishments so far and are committed to achieving a truly effective open access environment. I can't say it will be easy, but I know it will be worth it. Our preliminary economic analysis of the program shows consumer savings of at least $3.75 to $5.5 billion annually.

Furthermore, implementation will stretch our resources because many issues will arise that neither we nor anyone else can foresee now. To give one example: the way that power pools operate will change under non-discriminatory open access. Power pools are business arrangements that utilities enter into to share their resources. After our rule, the economic benefits of power pools will be as important as ever. But the traditional way of running many pools is far removed from real open access. We do not know exactly how issues involving power pools will present themselves to us. But we can be quite certain that we

will receive many filings. Reforming power pools will involve extraordinarily complex proceedings and require us to review hundreds of filings. These cases will require a major, ongoing effort on our part.

In the longer run, the rule will be only the beginning of massive change in the industry. And those changes will appear before us as a series of very new and difficult issues that we will need to address in balanced and innovative ways.

One key area where new issues will arise is in the split between State and Federal jurisdictions. With the coming of a fully competitive electric industry, many of the traditional distinctions between State and Federal authorities are becoming increasingly difficult to maintain. It will be a major challenge to develop a new balance with the states that fits the future rather than the past. This will be especially true because states all over the country are developing new -- and very diverse -- approaches to power markets. We will need to respond to all these different approaches in ways that compromise neither interstate commerce nor the legitimate interests of the states.

Virtually every other aspect of our electric business will change also. Competition will put almost every institution and issue in the industry in a new light. For instance, mergers will mean something very different in tomorrow's industry where competition is the norm from what they meant in yesterday's industry of regulated franchise monopolies. As a result, we will need to develop new approaches to mergers and market-based rates. After all, the traditional structure of the industry may leave generation ownership heavily concentrated in many local power markets, even with full open access to the transmission grid. The implication is that we will face much more difficult cases on mergers and market-based pricing than we have before. Given the indications of the last few months, we are also likely to face more of them.

Similarly, transmission pricing will have new importance. Competitive generation could easily be compromised if transmission pricing is not structured to support competition in generation markets. So it will be increasingly important to develop innovative transmission pricing policies that are appropriate to competitive generation markets. The issues will be very contentious. As our natural gas experience shows, the existence of competition in generation markets will affect what types of pricing are possible for transmission. Devising good transmission pricing policies will, if anything, be more difficult than ever before.

I would like to emphasize a key point: fostering competition does not always mean deregulation. In fact, the electric industry will continue to depend on some key services --

like transmission -- that will not be competitive. For the foreseeable future, transmission will continue to be a regulated monopoly with important market power issues at stake. The power generation market, in contrast, will be increasingly competitive and regulatory controls can be streamlined and often eliminated. In many respects, continuing regulation of transmission will be the essential foundation of competitive generation markets. Given competitive markets, even small anomalies in regulating transmission -- or small mistakes in not regulating it -- have the potential to cause major changes in competitive relationships for generation.

And other market power problems will arise. Nurturing the competitive potential of the industry will require new, carefully crafted forms of regulation. But in the absence of pro-competitive regulation, the remaining forms of market power in the industry could easily strangle the very competition that the Nation needs.

To sum up: we are entering an exciting period in electric power. It is a time that will require the best that the Commission has to offer, and it will require our best for a sustained period. I believe that our budget proposal, with its modest increase in our electric effort, will let us meet the challenge and do our full part to bring all Americans the benefits of a fully competitive electric power industry.

NATURAL GAS

Let me turn to natural gas, where we oversee more than 130 interstate pipelines. Natural gas supplies almost a quarter of the Nation's total energy needs.

In 1992, the Commission issued Order No. 636, which was a landmark in the long-term restructuring of the natural gas industry. Order No. 636 required pipelines to restructure their operations to bring the benefits of competition at the wellhead to consumers. The order let pipelines recover prudently incurred transition costs.

The past few winters have proven that Order No. 636 works. The Nation faced severe weather in January 1994, Order No. 636's first winter, and even more severe weather this past winter. In both cases, the industry responded with greater flexibility and greater reliability than ever before. Customers who needed gas could get it. Prices rose rapidly during the severe weather -- as they should have done. And they fell just as fast when the emergency subsided. This is a sign of markets at work for everyone.

Order No. 636 is part of a market-driven revolution in the gas industry. Today we see spot markets for natural gas, sometimes operating at very short time intervals. We see release markets that let customers purchase pipeline capacity from firm customers who can afford to give it up. We see new risk -- management tools, such as futures contracts. The result is an industry that provides better service at lower prices to customers all over the country.

However, as in electric power, competition in the gas industry is not the same thing as deregulation. Indeed, one of the greatest threats to continued competition would be inappropriate deregulation. The fact is that market power remains in the transportation sector of the industry. Customers on both ends of the pipeline grid -- perhaps especially natural gas producers -- need the assurance of our continuing work in the industry.

In many ways, the work and issues that we face in today's competitive natural gas world are more difficult than those we saw before Order No. 636. The industry is evolving rapidly, as are the areas where pipeline customers might need regulatory protection. Regulating for competition presents challenges that require very new approaches from those we have used before.

For example, competition often requires more flexibility. That is why we have issued a Policy Statement that gives pipelines alternative ways of setting rates. These can include performance-based rates, where pipelines would be rewarded for cutting costs and improving service. They can also include recourse rates, where pipelines and customers negotiate rates and terms, as long as Commission-approved rates and services are available to anyone who wishes them. Market-based rates are also an alternative when the transporter can show that it lacks market power. In all these cases, the likely result will be a stream of novel filings before the Commission.

Similarly, competition has let many pipeline customers operate more efficiently. Many of them need less firm pipeline capacity than they did before. When their contracts come up, such customers may sign up for less capacity. This is the decontracting issue. We are already seeing cases that raise the issue, and we are likely to see many more. Decontracting raises potentially serious implications for cost recovery and the future of the industry, and it is likely to increase our workload.

Perhaps most important is our certificate work, especially in approving new pipeline construction. Natural gas is a key component of the Nation's energy and environmental future. So it is important to respond quickly and appropriately to certificate applications. At the same time, pipelines raise environmental issues of their own. And the decontracting issue makes clear the

inherent riskiness of major capital outlays. All this means that certificate work is at least as difficult as it ever has been.

Finally, I would like to mention the increasing convergence between the natural gas and electric industries. Many electric generators have needs that other natural gas customers do not share. For instance, they often need the flexibility to change loads during the day. Others need new ways to share risk with their suppliers, either gas producers or transporters. The natural gas industry is providing such services. For example, intra-day nominations, which let shippers change their takes every few hours, are becoming more and more common. In this sense, the increasing competition in electric power is feeding back into our natural gas work in the form of novel gas services.

The natural gas-electric connection has implications for the electric industry too. For instance, natural gas is becoming more and more the fuel of choice for generators. Our studies show that the most important factor in determining future environmental impacts from the electric industry is the competitive position of natural gas. If natural gas prices continue at current levels compared to coal and if gas technologies continue to become more competitive, the result will be greater opportunities for natural gas and net environmental benefits for everyone.

To sum up: the problems we face in natural gas are both novel and important. We have been able to absorb a substantial cut in our natural gas staff in recent years. But any further reduction would threaten our ability to encourage competition and efficient pipeline expansion while protecting customers from the market power that still exists in the industry.

HYDROPOWER

I will finish by talking about the hydropower program. We regulate more than 1,600 projects that produce about 48 percent of all the Nation's renewable energy.

For the last several years, the biggest effort for our hydro program has been the large bulge of relicenses that started in 1993. I had hoped that we would finish all these cases by the end of 1995. We have made substantial progress. But in some cases, the issues have proven more difficult than we expected. We continue to work at these cases and will resolve them as soon as possible.

Hydro issues can be highly contentious because so many important competing uses for any given waterway must be reconciled. Many issues will be best resolved if the interested parties can come to agreement. This approach encourages mutually

agreeable bargains and saves much time in litigation and appeals. We are committed to doing the consensus-building necessary to reach voluntary settlements wherever reasonably possible. We can continue to honor this commitment, provided we are able to devote enough resources to the process.

A notable example of innovative approaches to licensing is the recent Memorandum of Agreement between the Commission, New York's water quality agency, and the New York Power Authority, which is the licensee for the St. Lawrence project in New York State. Under this agreement, the licensee will fund a third party contract environmental document for relicensing of the project, to be jointly prepared by the Commission and the State agency. This cooperative approach, plus "front-loading" the environmental review process and including all interested parties, should shave years off the relicensing process and minimize the transaction costs for all parties.

That is particularly important because we face another wave of relicensing later in the decade. In many cases, the coming relicenses will involve very large projects. To handle these cases expeditiously, we must learn as much as we can from the Class of '93 and develop cooperative approaches like that used for the St. Lawrence project. We have also begun to examine our relicensing regulations to see if we can make the process work better.

Dam safety remains one of our most important jobs. We continually work to find better ways to ensure the safety of the Nation's dams. For instance, we are conducting state-of-the-art seismic evaluations to determine how new seismic theories may affect safety at dams in areas that are prone to earthquakes.

The Fiscal Year 1997 budget reflects a reduction in the resources earmarked for our hydro program. Further reductions should be possible when the relicensing cases are resolved.

CONCLUSION

It is an exciting time to serve on the Commission. My colleagues and I are committed to the goal of increasing competition in both the natural gas and electricity industries. We are endeavoring to use our resources wisely, and appreciate your continued support of our efforts.

This concludes my statement. I will be happy to answer any questions you may have.

Federal Energy Regulatory Commission

Official Biography

ELIZABETH ANNE MOLER

Elizabeth Anne ("Betsy") Moler serves as Chair of the Federal Energy Regulatory Commission. She was designated Chair by President Clinton on February 5, 1993. She was first appointed to the Commission by President Reagan on October 5, 1988. She was reappointed by President Bush and again by President Clinton. Her term expires June 30, 1999.

During her tenure as Chair, the Commission has successfully completed the restructuring of the natural gas industry under FERC's landmark Order No. 636 and has initiated a major inquiry on market based and incentive rates for natural gas pipelines. The Commission has also promoted open access and competition in wholesale electric power markets. It has begun to deal with restructuring issues in the electric industry by establishing a "comparability of service" requirement and proposing new rules to deal with the recovery of costs stranded due to the restructuring. The Commission has also begun issuing new licenses for the unprecedented number of hydroelectric facilities whose licenses expired in 1993.

Before joining the Commission, she was senior counsel to the U.S. Senate Energy and Natural Resources Committee. She joined the Committee staff in 1976 and worked for the late Senator Henry M. Jackson and Senator J. Bennett Johnston. Her Capitol Hill experience dates to 1967.

She grew up in Ogden, Utah, and attended The American University School of International Service, where she received a B.A. in international relations. She has a Juris Doctor degree from the National Law Center at George Washington University. She is a member of the District of Columbia Bar Association, and the American Bar Association.

Ms. Moler is a Democrat and resides in McLean, Va., with her husband and two children.

February 1996

FRIDAY, MARCH 29, 1996.

DEPARTMENT OF ENERGY

WITNESSES

HON. HAZEL R. O'LEARY, SECRETARY, U.S. DEPARTMENT OF ENERGY
JOSEPH F. VIVONA, CHIEF FINANCIAL OFFICER
ELIZABETH E. SMEDLEY, CONTROLLER

Mr. MYERS [presiding]. The committee will come to order.

We're pleased today to have the Secretary of Energy, Mrs. O'Leary, back. You're one of the few witnesses we've had who has come in different capacities—I think you appeared representing the utilities a few years ago—

Secretary O'LEARY. Yes.

Mr. MYERS [continuing]. Now as a Cabinet officer.

Secretary O'LEARY. It seems like a lifetime ago, sir.

Mr. MYERS. Oh, have you forgotten that, too? [Laughter.]

Secretary O'LEARY. Almost, but I do now recall.

Mr. MYERS. It's nice to have someone who knows about the private sector who has served in government roles. Too often we have people who do not have experience, and I think most of the people feel a little more comfortable if we have someone who does have some experience in the real world before they come into government. I wish we had more Members of Congress with those qualifications these days.

But, in any event, we're pleased to have you, Secretary O'Leary.

Secretary O'LEARY. Thank you.

Mr. MYERS. Your prepared statement will be placed in the record, and you may proceed as you'd like.

OPENING STATEMENT OF SECRETARY O'LEARY

Secretary O'LEARY. Thank you. I have just a few, what I hope will be, very brief remarks. And I really wanted to start by reviewing not only the Department's substantive accomplishments, but since the budget reduction of the Department of Energy is the largest by percentage than any other of the Federal agencies this year over the three years that we've been presenting budgets to this Congress, I thought I might begin with a very quick review of how we have come to remove so many costs, and, therefore, adverse impacts to the American taxpayer.

The focus I'd like to make is that in fiscal year 1993 the budget that we presented to this committee was at $19.3 billion. Now, in honesty, what we've done is shown the 1996 appropriation and the 1997 request at $16.3 billion. I'll be very quick to tell you that there's about a million dollars or two less in this appropriation for fiscal year 1997. We simply did not bother to take out the decimal points because it seemed rather, if you will, disingenuous.

The point I think we can make from this presentation, as I discuss outcomes from last year and outcomes that we have set as goals with this year's budget is that we've taken on many new assignments with that very constrained budget.

STRATEGIC ALIGNMENT

I wanted to show this committee how we had, in fact, removed the $3 billion from the fiscal year 1993 appropriations from today's request. It's a very simple piece, and I'd like to remind you all that I was here last year talking about using strategic planning and total quality management techniques, as well as contract reform; contractor freezes; our own employees' efforts at strategic alignment, having them examine the work that they do and remove the non-value-added work; and finally, the help and assistance from Bob Galvin with his review of our 10 national laboratories, as well as Dr. Dan Yergin with this hard look at how we invest in technology for energy security. That, in sum total, brings us to the $3 billion, with a staff reduction on the contractor side already at 30,000. We don't claim credit for all of that because we've gotten a lot of guidance from the Congress.

I want to talk for a moment about regulation reduction, which has been a high cost of non-value-added work that all of us see. And the idea here is we've been enforcing ourselves far too much. And by simply going in and looking at the redundant regulations and guidances, we have reduced substantially costs within the Department of Energy. I'd like to talk very quickly about a demonstration program with 14 of our national labs to simply try and make the review and enforcement work much more sane and comprehensive.

We have managed to reduce the numbers of man- or person-hours spent on enforcement or oversight at 14 of our laboratories from 28,000 person-hours to something less than 4,000 person-hours, about 3,800. In substance, what this means is that we have also reduced the cost of this oversight from what was at $10.2 million to less than $3 million, or $2.8 million. It's just one example.

I want very quickly now to move to strategic alignment because I think last year, when I spoke to this committee about the effort of the Department's own employees to look at and strip out non-value work, people thought it was pie-in-the-sky. I'm here to tell you that halfway through the fiscal year we have racked up already more than $135 million in savings and we project $277 million by the end of this fiscal year first of all, in the reduction of support contracts, and I know we all don't agree about what they are, but with those that we have counted, we've beaten our goal of $90 million and come in now at a projection of $120 million for this year.

In staff reductions, we can report that we've reduced staff significantly and we are 40 percent ahead of target for this year in reducing staff by some 1,350 souls at the Federal level. You can see the reduction there.

And I just wanted to note for a moment travel savings, because I know there's been a lot of discussion about that.

Mr. MYERS. Which one is that? [Laughter.]

Secretary O'LEARY. That's everyone's travel, and in fact, that we have reduced our travel significantly. The target that we set was to reduce it by $35 million; in point of fact we project that we will reach $40 million. We've done that while still conducting what I continue to believe are very important trade missions to sell U.S. energy products abroad and create jobs at home.

I want to move on very quickly to the next chart because I think this points to what I've just reported. And that's, very quickly, to remind you that the five-year estimate for reduction of staff of the Federal employees is at 27 percent. We are 40 percent ahead of target and we're capturing the Department of Energy's own employees, not those in the Federal Energy Regulatory Commission or the Power Marketing Administrations. So you can see by this fine example that we're already 40 percent ahead of the schedule that we have set for ourselves. I have every confidence that we will meet this mark of getting down to 10,000 by October of 1998.

ENVIRONMENTAL MANAGEMENT ACCOMPLISHMENTS

I want to turn from what appears to be sheer management accomplishments to talk about substantive accomplishments. I'm not sure whether you've seen this chart, but I have used it now three or four times. One of the challenges to our programs is to take this kind of hard management and turn it into real results. The example we're using here is our environmental restoration program, which has the responsibility for cleanup.

When we took this job, if you'll observe the green line, only 35 percent of the budget allocated to that program was actually being used to clean up, that is, actually to put things in place and return them to a situation where they could begin to be used for other purposes. You can see that paperwork, which is studies, assessments, and, of course, environmental impact statements, which we must do were eating up 58 percent of the budget by the time we arrived.

The landlord costs, are about 7 percent. I want to leave you with a clear impression, especially since Mr. Frelinghuysen is here, and we discussed last year what the complex was like and I told you I would be able to tell you. Well, we do now know because we have completed a total assessment of our complex. I will be providing shortly some information, but we will also be rolling out next year in a public announcement an assessment of all of our sites, building by building, structure by structure, and also the assets contained within those sites, as well as the wastes.

But you can see that landlord costs, which represent really the management of city-size complexes with roadways and often their own electric power systems, are costs that have gone up, and that represents the fact that many of the weapons production sites now not being used to produce weapons have moved over to the environmental management side.

The most startling fact here is that, finally, at the end of this fiscal year, we are moving toward using 67 percent of cleanup in those funds for actual cleanup. So we've gone from paper to real work. I'm not using this as an opportunity to criticize others who went before us. You can see the crossover occurred in 1995. That represents some of the assessment work that we, ourselves, had to

do with respect to identifying the vulnerabilities on our sites, so that we could match the cleanup dollars to the risk involved. That is, in point of fact, what we've done with our programs.

If you'd look at the record for fiscal year 1989 to 1993 in this environmental management program, only 11 sites were cleaned up. In 1994, we began to de-emphasize paperwork and looked at interim actions, as the GAO had asked us to do. This year we can say at this time that 194 of the 705 large sites are cleaned up. We've stopped studying sites to death. If you want a statistic, I would like to give you one: 5 million cubic yards of mill tailings in that one uranium mill tailing program, soil and rubble have been stabilized, contained, and otherwise addressed. If you want to give a descriptor that real people understand, if you had a pipeline diameter of about 2.5 feet moving from Newport News, Virginia, which happens to be where I'm from, to San Diego, California, which happens to be where my grandmother used to live, then we could run that pipe from Newport News to San Diego and back again, and that would contain all of the material that has been stabilized or removed from sites.

WASTE PROCESSING

We've also focused on privatization to reduce government costs where the private sector can do the job better and has the technology. What you'll get this year out of this program is more cleanup. The final thing I'd like to mention is just this; on the 11th of March we started up the defense waste processing facility, beginning the process of vitrifying high-risk, dangerous nuclear waste, taking it out of aging and leaky tanks and turning it into substance that can be vitrified.

Mr. Myers, I'm told that you're going to Savannah River shortly. By the time the committee arrives, it is my hope that logs will be coming out of the vitrification. plant and being moved to the storage site. This is something that people have conceived of since 1979. More importantly, for our tenure the budget that we crafted to finish that project, which was in jeopardy, came in on budget and ahead of schedule.

Also, if you're looking for another milestone, by the summer, in June sometime this year, at our West Valley plant in New York, we expect that that vitrification plant will start up as well. So, certainly, before the last of the rhododendrons are finished blooming, maybe we'll have something else to celebrate.

As you may know, in this environmental management program, which has responsibility and oversight by our Under Secretary Designate Tom Grumbly, we've also moved the civilian waste management program under him. I know that this committee has had a very lively, and I hope insightful, hearing with my colleague Dr. Dreyfus. There's just a few things I'd like to say in overview, and I think the committee well understands them.

CIVILIAN WASTE MANAGEMENT PROGRAM

I've been walking around town now for about four months with bi-weekly charts showing the progress in the tunnel itself. You have to recall that there was no tunnel, Mr. Myers, the time before last when you were at Yucca Mountain, and that we had spent ap-

proximately $2 billion on the site itself. The green line represents the plan for where we'd be in the tunnel boring if we were simply sticking to plan. This well-managed, vigorous program, spending only $900 million compared to the almost $2 billion before we started, is well ahead of schedule. It's almost 46 percent ahead of its schedule, and, more importantly, about to the milestone of three miles. In sum and substance, what you'll buy for the end of fiscal year 1997, is we'll be through that tunnel, and I believe that we will be in a position to have Dr. Dreyfus, and certainly our team of oversight folks, especially the technical review team, in a position to focus on site viability and what it requires to take an application to the NRC to move us toward licensing of the site.

I read someplace about a year ago that folks said the Department of Energy couldn't manage a paper bag. Well, I think we've managed more than a paper bag in this instance. We've taken a program that was under tough scrutiny and lots of negative commentary regarding its management and its progress, and turned it into a real winner.

I know that there will be other questions. So I think we'll let it go with that.

MATERIALS DISPOSITION

Also, reporting under Mr. Grumbly is, what we call, the fissile materials disposition program, headed by Greg Rudy, who's here in the room. It's a modest program, but it's a program that helps us to focus on the ultimate disposition of fissile material. That has been something that has plagued the Department for some years. Again, approximately two weeks ago, we announced a draft environmental impact statement that focuses on the nontechnologies to dispose of plutonium. I will simply reiterate, they focus on vitrification; they focus on the use of a reactor for denaturing the plutonium, and also a deep bore hole repository.

What you will get in fiscal year 1997 with this relatively modest budget is forward movement on the other technologies; likely two or three of them will be selected when the record of decision is ready, and I would suspect that that will be sometime very late this year.

The other good news that you may have missed is that we've also completed our draft environmental impact statement on the disposition of highly enriched uranium, and that record of decision ought to be ready before the end of this summer. In summary, this is meaningful progress on how to manage this waste.

The other element that Mr. Rudy and his people have completed is a draft environmental impact statement that comes to closure on the issue of what should be the interim storage facilities and where they should be located, as we move toward the ultimate disposition of this material in some repository. That work, I'm proud to say, will also be completed. More importantly, what we're asking for in fiscal year 1997 are funds to begin to do some of the prototype work on a storage facility which will be modular and from which we can learn and build more. It's a program that's spent about a year in pulling together the options and winnowing through them with lots of help from outside technical review. I am proud of this work because I had no sense when I arrived at the Department of

Energy that I could be here today reporting to you this extraordinary progress.

DEFENSE PROGRAMS

In the area of national security, a request for a slight budget increase, smaller by some that you'll hear, I suspect, approximately 6 percent. What we're getting from this is a continuation of a robust, nuclear stockpile, and deterrent, while at the same time we downsize our weapons complex in place to reduce costs and to improve safety.

With respect to our decision not to test nuclear weapons any longer, we've come up with a science-based program that permits us to use proxy for nuclear testing and rely on the instruments of science and technology to help us understand and verify the continuing safety and reliability of these weapons as they age and stockpile. Most of the funds being asked for in this program go to things that you well know.

Number one would be the design of the National Ignition Facility, for $190 million; for tritium planning, $100 million. And you will understand that we've spent some time trying to determine what is the best course for production of tritium for the United States military need with this degenerating gas that has to be replenished.

In looking at our options, we made a determination very late last year that we could bank on one which was perhaps the option to use a commercial reactor to produce tritium, either with an existing reactor or with a partially built reactor, or we could build an accelerator which might do the same thing. We decided that it would probably make the best sense to permit the technology on the accelerator to be proven out on a bench model in a laboratory and to continue to seek to identify a commercial entity that might like to sell the services or sell the reactor.

In point of fact, I can tell you that just this week we got the announcement from some 14 commercial and quasi-government entities indicating that they had an interest in providing either radiation services or selling their reactor for that purpose. We continue this relatively vigorous program on a dual course, and we do so, quite frankly, because we have learned by experience, sometimes very bitter experience, that large, expensive technology, while we all embrace it at inception, is not always supported by the public or the Congress as we go forward. So we continue to hedge, I think very responsibly, by looking at the two technologies.

NONPROLIFERATION

What we've also gotten in this program under the area of nuclear nonproliferation is tremendous growth in our ability to help the former Soviet nations, the Newly-Independent States, to secure the dangerous nuclear weapons material now removed from nuclear warheads. The way I'd like to describe this, quite frankly, and have often, is that before the Cold War was over we were clear that there was one Russian bear. That was the entity we watched, representing the Soviet Union. We were then concerned about flying nuclear weapons. Well, the missiles don't fly anymore, and what we're concerned, quite frankly, is about the migration of the mas-

sive fissile material, bomb-grade material, now contained in the former Soviet states.

The Department of Energy's responsibility is to help all those former Russian states, now Newly-Independent states, to maintain safety and security, and to be able to account for the fissile material contained in their civilian complexes, mostly their institutes and some reactors for research, which I would liken to our national laboratories.

The story I can tell you very quickly is that, in fiscal year 1995, when we began this work, we were able to report at the end of the year that we had helped the Russians secure some 70 kilograms of only low enriched uranium at one site. At the end of this past fiscal year, we could have told you that we helped to secure 8 tons of high enriched uranium and plutonium, and by the end of the fiscal year for which this budget request is submitted, I can tell you that we will have helped them secure hundreds of thousands of tons of high enriched uranium and plutonium.

If you want another snapshot, we have moved from one facility to 35. We were working with the Russians to establish the kind of detector systems, accounting systems, and high-technology monitoring systems that we have in our own facilities here in the United States. That work, and the work in dismantling safely this year some 1,300 warheads, has really helped to move us to posture last year where we could get signature on the nonproliferation treaty with an unconditional extension.

The work we do today leads us toward a Comprehensive Test Ban Treaty. The other money we're asking for in this area will focus on our verification for the Comprehensive Test Ban Treaty and surveillance work necessary to help us understand whether the export controls we have in place actually are getting the job done.

That permits me, very quickly, to talk about our work with the North Koreans. I know the Chairman and others on this committee will want to talk about it. I will tell you that I now wish I had brought a set of extraordinary pictures, taken only two months ago, of U.S. technologies working with their counterparts in North Korea to, first of all, stabilize that pool, where very quickly decladding material was flaking and putting the spent fuel within the pools at high risk. Most importantly, I would tell you that what we have learned in that reactor, we would have paid many, many millions of dollars to get that information otherwise. But I look forward to what I know will be a very spirited discussion in that area.

SCIENCE AND TECHNOLOGY

In the area of science and technology, I would simply say that, here again, I know that I can look forward to some spirited debate on the way this program has been shaped and has functioned since our inability to move the Tokamak experiment to its next logical stage. The summary is to say we continue to invest in our user facilities, which give us outstanding payoff not only in basic science, but, perhaps more importantly, in technology which gets moved to the marketplace.

I thought and thought about the one thing I might bring to this Committee to show the kind of work that's coming out of some of these laboratories under Dr. Krebs' excellent supervision. She will

perhaps be appalled because I have brought a golf putter. [Laughter.]

I've only brought this putter because I cannot bring in a roll of steel, which is what I'd like to bring in. This putter is made of a nickel aluminide, which is a much stronger form of aluminum and nickel which helps in the production and fabrication of steel as it is rolled out of plants, both reducing error and, perhaps more importantly, reducing energy costs. It shows up pragmatically in places like refineries where piping must be used, in steel mills where they're forming actual pipes and other products for work.

The issue, quite frankly, is: how do you keep the brittle metal from breaking when such high heat is used to form it? In this instance, the nickel aluminide is much more expensive. It does not fissure or break. The cost for the raw material and nickel have been reduced by 50 percent. Energy costs and fabrication have been reduced dramatically as well.

This is the kind of work that comes out of these laboratories. I've been told it improves your golf putting. I haven't been at it——

Mr. MYERS. That's the bottom line. [Laughter.]

Secretary O'LEARY. I haven't been at it in years, but it is another example of what we're doing in advanced material that shows up in refineries, and that, first of all, is used in foundries to reduce the cost of fabricating what is the very foundation of industrial work in the United States of America.

Mr. MYERS. I thought you brought it along for protection. [Laughter.]

Secretary O'LEARY. Someone said that as I was leaving my building. So I gave it to Mr. Forrister, so he could use it as he sees fit. [Laughter.]

But I haven't used a golf club in three years, sir.

There are other areas that we could talk about in our basic science program. I think one thing I'd like to talk about is the fact that this program is much more carefully integrated. The basic science program in energy research complements the work done in our defense laboratories, and, most importantly, complements the work being done on the fossil and energy efficiency side, so that the laboratories are being managed now as a much more strategic entity.

You may not have noticed that last week, under the guidance of our Deputy Secretary, Charlie Curtis, and John McTague from the Ford Motor Company, we have rolled out a strategic vision for the laboratories to manage them much more efficiently by their mission and their principal work. That study, which we'll provide to the committee, provides rich detail with respect to the principal capabilities and the secondary capabilities of each of our laboratories. The study will advise us as we move forward to do what we've done in our energy technology area, which is to consolidate these laboratories and offer some of them for privatization.

I could talk about the B-factory, but I suspect that I will have a chance to do that later.

ENERGY EFFICIENCY

I'd like to move now to the area of energy security. You may recognize that the budget in the energy security area, if one would

look at fossil fuel and coal, as well as nuclear budgets, tends to be up this year, but up specifically in the area of energy efficiency and renewables. This is the area of oversight for this committee. I thought I'd just discuss very briefly some of the outcomes from last year's expenditures and point you toward what you can expect this year.

This year, in fact just two-and-a-half weeks ago, four major companies in the United States were announced as winners for an opportunity to bid for the provision of 160 megawatts of photovoltaic power at our Nevada test site, again, indicating new uses for the Nevada test site. It is interesting that that site would be selected because we seek new missions for the test site as we begin to downsize, as the work of testing requires standby status only.

The thing that you should hear from me about this is that the companies who bid for this opportunity are Cummins Engine, providers of large turbine engines in the United States of America. The point beyond the obvious, Mr. Myers, is the fact that you've got a large industrial company now looking forward to developing a line in solar energy because they recognize that not only is the market about to ripen extraordinarily, but the market is there in international areas because the price is right internationally.

We also have Amoco Enron, another energy company, with its solar arm bidding for that opportunity, and, more importantly, already telling us that they can bring in solar at under 5-cents-per-kilowatt hour at the busbar, which is competitive with just about everything I know of, even natural gas.

So, in summary, the money we're asking for is to simply help us to push further to the marketplace this excellent technology. You need to know that some are projecting about $200 billion in the marketplace globally for this technology. What we're buying this year with the solar budget, up about 30 percent, is collaboration between the Federal Government and industry to deploy this solar energy, and so we're not asking you to make an investment in this technology that only comes from the government alone. The private sector, too, is putting more than 50 percent on board.

Some examples would be—well, now what could I think of? How about a little biomass and rice straw being used for a biomass facility in California? How about bio-diesel——

Mr. BEVILL. When are you going to get to Alabama? [Laughter.]

BIOMASS

Secretary O'LEARY. I'm going to work it, a little bio-diesel right now, sir. A little biomass—I'm getting as close to Michigan as I know how, of course, in Alabama, where we have attempted to support many projects coming out of the university there.

For bio-diesel, I can only get as close as Chicago, but I need to talk about it because it benefits States. Here we're taking waste oil from almost any cooking process, blending it with soybeans, blending it with alfalfa, and creating a fuel that is cleaner and it can be used, and is used, in Chicago in a transportation system run and managed, not only by the city of Chicago and the Illinois Transportation Commission, but also used by a private company which is a touring bus service there. This capability also exists in

Framingham, Massachusetts, where there's a similar firm doing the same thing.

The opportunities we're asking for are to further push and deploy these technologies out into private firms. I can talk about Columbus Foods in Chicago with a third-generation family having come from simply bottling olive oil to the growth in the oil industry to meet the needs of food provision, now going into providing this alternative fuel.

These are very exciting concepts. I was delighted to be at a private facility in Chicago, as opposed to some government laboratory. So these technologies are being deployed and you can expect more.

GEOTHERMAL

I want to touch very quickly on geothermal because I know that there is an interest, too. The geothermal program is only asking for a 7 percent increase. Here we expect to focus more on hardware. I need to tell you that drilling bits developed in our programs here in which you have invested over time have spun off an industry for drilling bits for geothermal exploration only that amounts to a $200 million sale business this year.

The other work we're doing is collaborating with the States. We're focused on high-temperature, and, therefore, high-return fields. Many of the States desire to go into the lower-temperature fields, of which there are many more, and we're collaborating with several States, not the least of which is California, and I think Nevada, in that work.

Finally, partnerships with utilities for geothermal heat pumps, which offer competition to other heat pump sources, make real good sense to us in terms of the fact that the application and the hardware is so much simpler.

I'd like to say, very simply, that with respect to each plan we have for taking a technology to market, we also have a road map which takes a hard look at what the desired outcomes are, and, more importantly, what the understanding is of the technology to support those outcomes. This work is serious. Not only is it on track in terms of road map and understanding the technologies and using our laboratories and the business partnership to deploy, but, I think more importantly, it's on track in terms of being much lower cost than it was in years before.

In summary and substance, I'd end by saying you have a much more streamlined Department of Energy. You have one which is certainly focused on cost- cutting. You have one which understands how to collaborate with the private sector, to understand that we're not betting on the wrong technology for which there is no marketplace.

And, finally, I think you would determine, or I hope that you will determine, by reviewing both this formal testimony and thinking on the things that I've had to, of necessity, rush through, that we're also very much committed to delivering outcomes as opposed to paper or assessment or "Gee, I'll tell you later, sir."

Thank you very much for this opportunity to testify before you.

[The prepared statement of Secretary O'Leary appears at the end of the hearing record.]

Mr. MYERS. Well, thank you, Madam Secretary.

Gentlemen, I think that for the first round, 10 minutes for each person, and we'll go back for a second round, if everyone understands. And I'll try to advise you about a minute before that 10 minutes is up.

Well, thank you for your very thorough explanation here. I closed my eyes for a moment and thought: is this Ron Brown, Commerce, or is this the Secretary of Energy? But, of course, if we're going to do away with the Energy Department—our Commerce Department, well, someone has to be selling, I guess.

The mission of the Department of Energy has changed a lot in the years that Mr. Bevill and I have been on the committee, and, certainly, Mr. Chapman's been on the committee a number of years, as well as Mr. Fazio. But going back to the old days of the Atomic Energy Commission, the sole mission of that, of your predecessor, was for production, primarily of weapons at that time. And, of course, we are now producing energy for the civilian side and some weapons systems, some reactors, but also the research, and now the environmental cleanup, a whole new—something entirely new that we didn't even consider 30 years ago, about ever having to clean up these sites. Now we realize that, of the $16 billion, too much a part of it is now in environmental cleanup and waste management. And we have discussed this on other occasions, and we have not, this committee has not been very pleased with the lack of progress. There have been maybe a lot of reasons for it, but, apparently, now you seem to be on the right track.

Are you satisfied with the progress being made now in environmental cleanup as well as waste management?

ENVIRONMENTAL MANAGEMENT

Secretary O'LEARY. Well, I suspect that you get bad at this job if you're ever satisfied. Having said that, we always push toward more obvious and faster results, dealing with the communities and the workers who are on and live nearby our sites. But I have to stop to compliment Mr. Grumbly and the fine team of people that work with him, and, more especially, the people in the field who have had to get the work done. This has been an extraordinary turnaround from muddling through, trying to determine what are the next steps, and groping to actual results. I'm very proud to appear before you and tell you 194 cleanup projects are completed, but I've also told you what we've got left to do. So we need to continue to look at how we do this faster and how we do it at lower cost, which is why we're investing $300 million in the technology to help us do so. But I'm certainly proud of this program this year, and more so than last year, and more so than the year before.

I need to tell you, it continues to be the most dangerous work that I know about. It may be more dangerous in the Soviet Union, but we don't know as much about the Soviet sites as we do about the United States, but this is difficult, dangerous, and tedious work. Some of it requiring very few people to be in tight confinement in utterly hot rooms where they risk, in a mistake, real danger to themselves and to their colleagues. It is tough, tough and dangerous work. So I'm honored to be working with this great group of people who have had to use technology and teamwork to move us in the direction in which we're headed now.

Mr. MYERS. Well, this is very encouraging. This committee has had a number of oversight and volunteer witnesses come in, and they tell us two things: that we had contractors onsite who did not have the expertise nor the experience to do the job that we are asking them to do, and they were spending a lot of time learning the job themselves. Do you feel confident now that we in most cases, if not all cases, have the competent people and contractors now on a site?

Secretary O'LEARY. Well, I do, and I need to tell you why, and I'll try to do it very quickly. In the first full year of my tenure I began to meet at least twice a year with the leadership of our contractors, our managing and, now we call them, integrating contractors on the site. We've put extraordinary requirements on them, first of all, through the instrument of contract reform, which focuses their ability for reward and contract payment on whether they meet their milestones for cleanup.

I just last week had a review of the Rocky Flats site done by the president of the Rocky Flats site for ICF-Kaiser, who happens to be the large contractor there, and our site representative. And what I learned is, with this incentivized contract that actually requires and delivers specific and measurable results, they do. They do, and we see improved performance on every measure that's been incentivized through contract. And what I've also learned is that we're getting more for the dollar than we did in the previous contract, where they got much more in terms of award fee, but no real measurement toward results.

So I'm not, quite frankly, in a position to comment about the technical capabilities of each and every person on the contract crew, but I can tell you that we're getting much better results. I know this by the metrics used in examining Rocky Flats, and will be in a position to do that with the other contracts that have been re-let under this new, I think, more rigorous and businesslike regime.

Mr. MYERS. Well, this committee has been very concerned, as you well know.

Secretary O'LEARY. I do.

YUCCA MOUNTAIN

Mr. MYERS. Last year, through necessity of not having enough funds in the budget, we had to cut Yucca Mountain, of course, and the reward was they're deeper in the mountain now than they ever were. So we found that maybe money alone isn't the answer, and that's one of the criticisms—you mentioned Mr. Galvin a moment ago. He was quite critical, and others have been also, that we've been just throwing money. Contractors had lots of people there, but it's not getting the job done. And Yucca Mountain is a good example, I think. Yucca Mountain—we've got some problems with the utilities in some States. How many lawsuits do you have now?

Secretary O'LEARY. Well, there's actually one lawsuit with respect to the issue of whether the Department has an obligation——

Mr. MYERS. Trust funds, I'm talking about, 1 mil——

Secretary O'LEARY. Oh, goodness, I can only tell you that there are 21 States engaged in lawsuits, and I would have to say in those States, depending upon the number of commercial nuclear reactors

operating there, the majority of those reactors have, through their parent companies, sued the Department of Energy.

I want to think back—and thank God I'm not under oath—but I don't think the number is much greater than when I was on the other side of the fence.

[The information follows:]

LAWSUITS

At this time, there is only one lawsuit in the Federal court system involving DOE's Civilian Radioactive Waste Management Program, Indiana Michigan Power Company v. DOE, Nos. 95–1279, 95–1321, and 95–1463 (D.C. Cir.). This case involves petitions for review filed by various utilities, States, and State public utility commissions challenging DOE's conclusion that it is not unconditionally obligated under the Nuclear Waste Policy Act to begin acceptance of spent nuclear fuel and high-level wastes by January 31, 1998, in the absence of a facility sited, constructed, and licensed in accordance with the Nuclear Waste Policy Act.

YUCCA MOUNTAIN

Mr. MYERS. I was just going to bring that up.

Secretary O'LEARY. No, urging——

Mr. MYERS. You're a Minnesotan——

Secretary O'LEARY. That's right, but urging my CEO that it made no sense in suing because I prefer to have whoever was Mr. Dreyfus in the old administration working on the mountain, as opposed to working on the lawsuit.

Mr. MYERS. Well, the thing that bothers me about the lawsuits is the system. It's not necessarily the lawsuits that are so frightening, but it's the lack of confidence that the American consumer has today in their government and in the commitment that was made many years ago before you came on; it wasn't during your watch. Back in 1988, we made this agreement that we would accept the fuel by 1998, and we're not going to be able to do it. And I think there is real trouble there. It could be fatal to the nuclear industry. I hope it is not; I don't think it will be, but I think we have to be more concerned than just passing it off and saying, well, we're not going to get the job done.

And this committee's been very concerned about it, and Congress is becoming increasingly concerned. We provided—as you mentioned, interim storage—we provided, as you know, in the bill last year for interim storage contingent upon authorization, but we don't have that authorization yet. But there's going to be pressure again this year, I'm quite certain, from the utilities and from the utility users who are paying 1 mil per kilowatt hour into this trust fund. Do they feel they're getting—there's every evidence that they don't. Can you and we do something about that?

INTERIM WASTE STORAGE

Secretary O'LEARY. Well, I think we're doing it. I don't know who would have been here four years ago, but they could not have told you that they were less than three miles away from completing the work to get the answers on the technical work to file for site suitability. We're two years away from understanding whether we have the data and information to permit us to go forward to the NRC, to have the NRC determine whether the site—whether the information we've put together meets their requirements for licensing.

That was not the case when I walked through the door. We were not two years away.

What I believe needs to happen, quite frankly, is we need to finish this work. The sidebar to work on an interim facility gets us to taking care of the interest of those who have trouble with their commissions. This does not begin to meet the need that will exist in the year 2010, when far more spent nuclear fuel from commercial reactors will have to be stored than could be put in an interim repository.

So, to get lost from this task is to be very, I think, shortsighted, and, most importantly—and I regret that I have not focused on this in the past—it leaves behind all of the work that Mr. Rudy's people are now doing with respect to fissile material disposition because we have to have a repository for that material, too.

So I believe we ought to stay on course here and get around this loop and get these answers. I know that Dr. Dreyfus was before you——

Mr. MYERS. We had—yes.

Secretary O'LEARY [continuing]. And he testified, I'm certain, eloquently that he can make a determination on viability—that is, whether we have enough to go to the NRC—by 1998. That's progress, and it's real progress. Please don't stop us.

Mr. MYERS. Well, how many generation sites now are full with their spent fuel——

Secretary O'LEARY. I want to tell you——

Mr. MYERS [continuing]. Have they reached their capacity, present capacity?

Secretary O'LEARY. I want to tell you that there are four or five, and I should have looked at that detail much more carefully before I arrived here. The issue now, quite frankly, becomes at-site storage nearby a reactor. No matter what we do, we will not help the case of—I think it's GPU that's building a site near Oyster Creek; my old firm, Northern States Power; VEPCO, which long ago made its decision to put an onsite facility right at Surrey in Virginia, where I'm from; and Baltimore Gas and Electric. I think we have got to finish this work.

Mr. MYERS. No question about that.

Secretary O'LEARY. And we ought not throw money at a site or an interim facility, until we understand whether that site will be the ultimate repository.

Mr. MYERS. But what we're trying to do is help those utilities that you once represented——

Secretary O'LEARY. Yes.

Mr. MYERS [continuing]. With a very difficult problem. There are those who suggest just leave that, the waste, onsite, but you just—we spoke about North Korea. Look what's happened when you leave it onsite. It does deteriorate. So that isn't a satisfactory solution, or dry storage, in my opinion, at this point is not satisfactory. Is there some way—is there any consideration of expediting this process in any way? Is there any way?

Secretary O'LEARY. I think that we're about as expedited as could be.

Mr. MYERS. Okay.

Secretary O'LEARY. And, Mr. Myers, you used to beat me up terribly because we had no——

Mr. MYERS. That's probably true. [laughter.]

Secretary O'LEARY. You did, because we had no clear path for Yucca Mountain, but——

Mr. MYERS. That's right.

Secretary O'LEARY. I didn't need you to beat me up to do that. I mean, we knew what our work was. We have done it.

Mr. MYERS. It doesn't seem to have helped a whole lot.

Secretary O'LEARY. It has helped, sir. We're two years away. There was no tunnel in this mountain when I arrived.

Mr. MYERS. Yes, there were 200 feet maybe. I haven't been out——

Secretary O'LEARY. There was no tunnel, sir. Trust me on this.

Mr. MYERS. Just a hole in the——

Secretary O'LEARY. We put the tunnel in the ground.

Mr. MYERS. Okay.

Secretary O'LEARY. We put the tunnel in the ground.

Mr. MYERS. Let me explain to the people. A moment ago I mentioned about intelligence. Now I wasn't questioning the Secretary's mental capability. Militarily, when you examine someone else's capability, it's just called "intelligence," what we call, military G–2. And that's why she didn't—her intelligence was very good because she knew what we were going to talk about.

Secretary O'LEARY. So you're suggesting that the other isn't, sir? [laughter.]

Mr. MYERS. I'll leave that to the—everyone makes their own decision on that.

My 10 minutes is up. Mr. Bevill?

Thank you. We'll be back.

Secretary O'LEARY. Certainly, I expect it and look forward to it.

Mr. BEVILL. Thank you, Mr. Chairman.

And welcome again, Madam Secretary.

Secretary O'LEARY. Thank you, sir.

YUCCA MOUNTAIN ACCOMPLISHMENTS

Mr. BEVILL. You always make a very fine presentation, and you've answered several of my questions on Yucca Mountain. I'm very pleased to see that project moving now.

And, you know, I was out there a few months ago, and I think we had about 200 feet, and I was so pleased to see that, even that hole in the mountain at that time, considering back in the past——

Secretary O'LEARY. Yes, sir.

Mr. BEVILL [continuing]. We spent some $4 billion. So at least we had something to show for it for the first time. And so I think you've certainly come a long ways this past year on, as you say, getting on track.

As I understand now, it's very possible that the decision can be made in 1998, when actually that's been the date we've been hoping that we'd be ready to move into the business of actual storage, starting the storage. But at least you've—I believe, from what I understand your testimony, now you will be in a position in 1998, or you feel that you will, to make that decision and to proceed, then, to the NRC for a license.

Secretary O'LEARY. That's correct, sir.

Mr. BEVILL. Yes. And so everything, apparently, is, of course, is looking much better, the best, actually, that I recall on this subject, because I consider this nuclear waste disposal and high-level nuclear waste disposal certainly one of the most critical problems we have in this Nation. So it's encouraging to see that we are moving on this now. And, of course, the vitrification and the dismantling of warheads—all this is very critical. My State is actually, the defense part of it, is involved in Ft. McClelland.

Secretary O'LEARY. Exactly.

Mr. BEVILL. So I'm pleased—it's good to get your report.

I believe your map there shows that, as I mentioned, when I was out there, it's about 200 feet. Now you're three miles——

Secretary O'LEARY. Just short of three miles, sir.

Mr. BEVILL [continuing]. About three miles, and, actually, that's three of the five miles that's planned at this time.

Secretary O'LEARY. That's correct.

NUCLEAR WEAPONS CONTAINERS

Mr. BEVILL. And so I'm glad to see that.

We've had published, I noticed, in the news media that is great about giving one side of the issue, you know, and I'd like to hear the other side, about the canisters. As you know, the IG report in October of 1995 stated that the nuclear weapons containers were needed and that the air force had insisted they didn't need them. They, the Department of Energy, went ahead and produced them anyway at the cost of about $30 million. And I would like to hear your explanation of how that occurred and if any action should be taken by this panel to see that this situation doesn't occur again.

Secretary O'LEARY. Mr. Bevill, I have done my homework in terms of attempting to understand the exchange between the Department of Energy, which has the responsibility for ensuring the safe movement of warheads, either from the Department to its military customer or from the customer back to the Department's physical custody. What I know of these facts—and I have had to review the records to understand them—is that sometime in late 1989 a new regulation was being drafted that appeared to require a further element of safety with respect to the movement of these warheads in airplanes belonging to the Air Force. And, as you know from long experience, often these draft regulations can take a very long time to be concluded.

At the time that the discussions were held, it is my understanding that the Department of Energy, in consultation but not with sign-off from their colleagues in the Air Force, determined that they should begin to build these nuclear weapons carriers or containers based on the need that they expected to come when the regulation was made final. So that work was ordered to be done at one of our facilities.

The regulation itself did not move as an interim item until late 1992. My recollection is that it was in December or November of 1992. It then moved as an interim or draft regulation. The Department by that time had completed construction of what I recall now to be approximately, I want to say, 35 containers—someone will

help me if I'm incorrect; it may have been more. I think there were 54. I will get the detail.

[The information follows:]

NUCLEAR WEAPONS TRANSPORTATION CANISTERS

During the late 1970's and 1980's, the Army used Transportation Accident Resistance Containers (TARCs), furnished by DOE, very effectively in shipment of conventional high explosives (CHE) nuclear weapons. Based on this experience with the Army, DOE believed that the USAF would use the TRACs, if available, and chose to err on the side of enhancing the safety of these shipments. Therefore, the DOE was faced with supporting needs it believed the Air Force required and supporting these requirements, potentially, on a very short notice. The total number of containers for this activity was 87.

Secretary O'LEARY. The final rule was issued in November of 1993. And what I'm trying to identify is when someone should have had cognizance of the fact that there was no requirement to be met, if you will, by a customer.

At that time the Department and its defense programs area knew and understood that Air Force felt they did not require this container. In point of fact they have determined that they would not ship these warheads by air, but, in fact, would put them on railcars and move them in that way. The Department, nonetheless, continued to construct these containers, and did so until they were completed filling the number which had been ordered.

I am not in a position, sir, to tell you who was at fault and whether or not the Department should or should not have been forward-leaning in trying to meet a requirement. What I will commit to do here today is to now go back and more thoroughly look at the facts. I have reviewed the summary of the IG's report. In my opinion, since this issue began and the contract to do the work was let so very long ago, it's very difficult for me now to say, or to have anyone advise me, what punitive action should be taken. But I will take a very careful look at this once again. The thing that disturbs me is, was there an opportunity to halt, and, more importantly, what were the ramifications under the contract, if the contracting work had been stopped? I don't know those facts today. I will discover them.

Mr. BEVILL. So you are looking into it to prevent—take whatever action you may need to take to prevent this type situation occurring again?

AIR FORCE CANISTERS

Secretary O'LEARY. Mr. Bevill, I will tell you that the way the Department is now structured, I cannot conceive that this would ever happen again. The reason now is because the work within the Nuclear Weapons Council by both the Department of Defense and Department of Energy is based on a very clear set of authorities and permissions to begin work. I do not believe that this could happen today. The system is failsafe. The person who represents us on the Weapons Council is Charles Curtis. He is assisted by Dr. Reis. There are systems and protections and checks and balances within the system which, in my opinion, would not permit this to happen today. I will re-look that as well and I will take a personal look. I will not ask others to tell me.

Mr. BEVILL. Well, one thing appears to be obvious, and that is that your standards in the Department of Energy on safety are much higher than that of the Air Force, apparently. This seems to have come out, and certainly, with the statements you've made there, I would think that you would be in a position to prevent that again.

This is all, Mr. Chairman, I'm going to ask at this time.

Mr. MYERS. Thank you.

Mr. Knollenberg?

Mr. KNOLLENBERG. Mr. Chairman, thank you very much.

And, Madam Secretary, welcome this morning.

Secretary O'LEARY. Thank you, sir.

ROCKY FLATS EMPLOYMENT

Mr. KNOLLENBERG. We appreciate your coming before the committee.

I will echo, to the extent it has to do with security of our nuclear problem, and certainly the way that you've pitched in and attempted to—and I think, with some success, brought about a change in what I saw. And I still, looking back, reflect on a ballooning personnel number that grew from 1989 at Rocky Flats from about 5,000 to 7,500; at Hanford it almost doubled; at Savannah it almost doubled. And I'm one of those people that will check in on Savannah sometime next week to get a look at it, and look forward to that.

Believe me, the environmental management program is one that is very important. I hope that we can safely sunset that in some time, and I'll speak a little later about the BEMR report and what we may have in terms of some advances on that and some improvements on that. But I'm very concerned that maybe we aren't on target to reach our goal of coming to a conclusion or closure on that.

And let me talk about one problem that I think that we have in our office, and I think as Members of Congress, a hard time getting the lowdown on some numbers, some employment numbers. And I'm going to reflect in a moment on your chart, which I wouldn't question its validity, but I do think we have to look at the staffing levels at all of these major sites, and I include Hanford, Savannah, Rocky Flats, Idaho, and Oak Ridge.

I want to focus, more specifically, on Rocky Flats and bring up some information that my office and my staff has determined as to just what the FTEs are at that location. We had a figure on March 22, just a short time ago—I think that was about a week ago—that the figures out there were 4,657. That was on the 22nd of March. On the 28th of March, or this Thursday just past, the FTEs, according to a conversation we had with the office there, the FTEs at Rocky Flats were about 4,851.

And I remember your making a comment about Under Secretary Grumbly, pointing to his success in bringing things about, bringing some stability to those numbers. And just last week also, I would remind you that last Thursday he offered the information that the Rocky Flats FTEs were around 4,000, and then by Friday, the day after, he said they were below 4,000.

Now what I'd like to have, Madam Secretary, if I could, is for the record could you give me, please, the current FTEs at Rocky Flats, and would you kindly, if you can, divide those into the Feds and the contractors?

Secretary O'LEARY. I'd be pleased to do that. And on the history you've just recited to me, I would not dare presume that the record I have here is correct or would meet your requirement for correctness and accuracy. I've heard a swing of almost a thousand people in a week from three different sources.

Mr. KNOLLENBERG. We have, too.

Secretary O'LEARY. Well, I just heard it from you. And so——

Mr. KNOLLENBERG. Well, it's on the record. By the way——

Secretary O'LEARY. I understand.

Mr. KNOLLENBERG [continuing]. Mr. Grumbly testified before two authorizing committees last week——

Secretary O'LEARY. I understand.

Mr. KNOLLENBERG [continuing]. And in each succeeding—the two days were, I think, Thursday and Friday, if I'm not mistaken, but the numbers changed.

Secretary O'LEARY. Here's what I would like to do, with your permission and the permission of the Chair: I would like this afternoon to send you up a breakout of who is present at the site. I want to string this out so that I think you might begin to at least be a bit sympathetic to some of the challenge—who's there in terms of contractors, subcontractors; who's there under a Federal rubric, that is, a Federal employee; who's detailed there from a laboratory, which may be the case in what the period of time is. So I'd like to try to capture all of the categories. I'd also like to capture who is transient, which may be the case.

And I will review this with Mr. DeGrasse. I've got a mavin for the numbers Robert DeGrasse, who's really focusing on worker transition, which is something we struggle with. But I will get that to you this afternoon.

Mr. KNOLLENBERG. I would like it.

[The information follows:]

EMPLOYMENT INFORMATION

The attached table provides the total number of federal and contractor staff in each of the requested categories.

The FY 1996 increase of 8% reflects the FY 1995 staffing-up previously approved by Congress. During FY 1995, additional FTEs were provided to the site to improve managerial and financial control of the EM program, which is generally generated by for-profit contractors. These staffing increases were associated with technical staff in the Environmental Restoration, Waste Management, Nuclear Materials & Facility Stabilization, and Technology Development programs, and increases in financial and managerial support staff. The financial and managerial increases were associated with transfer of allotment holder and accounting responsibilities from DOE Albuquerque Operations Office to Rocky Flats, transfer of some major litigation responsibilities from DOE Albuquerque to Rocky Flats, and increased procurement responsibilities resulting from contract reform.

Environmental Management Contractor and Federal FTEs

Site	Federal Direct 1/ Clean-up	Federal Direct 2/ Support	Federal General 3/ Support	Federal Total	Contractor 5/ Direct Clean-up	Contractor 5/ Direct Support	Contractor 5/ General Support	Contractor 5/ Total	Total Direct Clean-up	Total Direct Support	Total General Support	Total Total
Idaho												
FY 95 Ratios	0%	80%	20%		35%	45%	20%					
On Board As Of 3/16/96	0	222	54	276	858	1,104	491	2,453	858	1,326	545	2,729
	0%	80%	20%		35%	45%	20%		31%	49%	20%	
FY 96 SAI Target (Federal)	0	211	53	264								
Target Distribution	0%	80%	20%									
FY 97 SAI Target (Federal)		196	52	248	729	938	417	2,084	729	1,134	469	2,332
Target Distribution	0%	79%	21%		35%	45%	20%		31%	49%	20%	
Oak Ridge												
FY95 Ratios	0%	0%	100%		40%	35%	25%					
On Board As Of 3/16/96	0	0	170	170	6,775	1,309	2,014	10,098	6,775	1,309	2,184	10,268
	0%	0%	100%		67%	13%	20%		66%	13%	21%	
FY 96 SAI Target (Federal)			163	163								
Target Distribution	0%	0%	100%									
FY 97 SAI Target (Federal)			145	145	5,889	1,116	1,659	8,464	5,689	1,116	1,804	8,609
Target Distribution	0%	0%	100%		67%	13%	20%		66%	13%	21%	
Richland												
FY95 Ratios	0%	0%	100%		40%	38%	22%					
On Board As Of 3/16/96	0	274	263	537	4,607	3,898	2,219	10,724	4,607	4,172	2,482	11,261
	0%	51%	49%		43%	36%	21%		41%	37%	22%	
FY 96 SAI Target (Federal)	0	268	256	524								
Target Distribution	0%	51%	49%									
FY 97 SAI Target (Federal)	0	261	248	509	4,607	3,911	2,234	10,752	4,607	4,172	2,482	11,261
Target Distribution	0%	51%	49%		43%	36%	21%		41%	37%	22%	

Richland Federal And Contractor numbers and mix is subject to fluctuation dependent on the final outcome of privatization and several other factors presently under review.

Environmental Management Contractor and Federal FTEs

Site	Federal Direct 1/ Clean-up	Federal Direct 2/ Support	Federal General 3/ Support	Federal Total	Contractor 5/ Direct Clean-up	Contractor 5/ Direct Support	Contractor 5/ General Support	Contractor 5/ Total	Total Direct Clean-up	Total Direct Support	Total General Support	Total Total
Rocky Flats												
FY95 Ratios	0%	0%	100%		40%	38%	22%					
On Board As Of 3/16/96	0	24	280	304	985	1,643	1,309	3,937	985	1,667	1,589	4,241
	0%	8%	92%		25%	42%	33%		23%	39%	37%	
FY 96 SAI Target (Federal)	0	24	270	294								
Target Distribution	0%	8%	92%									
FY 97 SAI Target (Federal)	0	20	265	285	830	1,310	1,232	3,372	830	1,330	1,497	3,657
Target Distribution	0%	7%	93%		25%	39%	37%		23%	36%	41%	
Savannah River												
FY95 Ratios	0%	0%	100%		60%	29%	11%					
On Board As Of 3/16/96	0	0	570	570	8,196	3,982	1,431	13,609	8,196	2,982	2,001	14,179
	0%	0%	100%		60%	29%	11%		58%	28%	14%	
FY 96 SAI Target (Federal)	0	0	549	549								
Target Distribution	0%	0%	100%									
FY 97 SAI Target (Federal)	0	0	495	495	8,144	3,426	1,316	12,886	8,144	3,426	1,811	13,381
Target Distribution	0%	0%	100%		63%	27%	10%		61%	26%	14%	

1/ This represents the "Space Suits"

2/ This represents the "Lab Coats"

3/ This represents the "Business Suits"

4/ In FY95 Savannah River was a dual purpose site (Defense Programs and Environmental Management) It is all Environmental Management in FY 96. This accounts for the significant increase in FTEs chargeable to EM

5/ Contractor employment is generally expected to remain at the same level as the 3/16/96 on board strength for the remainder of FY 96

Mr. KNOLLENBERG. I'll tell you why I'm interested.

Secretary O'LEARY. Yes.

Mr. KNOLLENBERG. And, incidentally, I don't, as I say, challenge the validity of your grant, but here's what I'm after. In my office we tend to think of—we try to break this up, and I think in talking to previous panels that appeared before here, they seemed to think it's acceptable in the fashion that we categorize it. We do it around our office in terms of those with—who wear spacesuits, the type that are actually dealing with hands-on nuclear material of one kind, whether it's high-level, or whatever; the lab coats, those people that assist the spacecoats, and then, finally, the administration people or business suits, we call them.

What I'm looking at this—and this may be—by the way, with the folks, as I say, that have come before us, they seem to be somewhat relaxed about using those categories. But when I look at these numbers——

Secretary O'LEARY. Sir, I wanted to quickly point out that I may not be as relaxed.

Mr. KNOLLENBERG. Okay. We have some water around here or whatever. [Laughter.]

But I think that the graph—and I want to refer to it. Now I would like to remind the people on the committee that the environmental restoration is only about one-third of the total expense involved or the total expenditure. And I know that you know that.

Secretary O'LEARY. Thirty-seven percent is the correct metric.

Mr. KNOLLENBERG. Well, that's close, pretty close. I wasn't too far off.

But I also know that the management or administration end of it, the business suit end of it, has gone up 8 percent. What I want—what I can't figure out, and maybe you can help me a little bit, is how is it that you can rise in that category for administration purposes when it's the hands-on people, it's the support people, the spacesuit and/or lab coat people, that are actually doing the cleanup, because I want to get to the same goal that you do.

Secretary O'LEARY. Exactly.

Mr. KNOLLENBERG. The concern I have is that, when I look at—and I'll give the Department credit, by the way. I think in Savannah and also at Hanford, at least based on the figures that we have here, and this is your numbers.

Secretary O'LEARY. Yes.

Mr. KNOLLENBERG. These are numbers that you supply. There has been some improvement in those, too.

But now Rocky Flats, I want to concentrate on that, because here's a performance-based contract. I think it was signed last July. And what I see is increasing business suit category, and that has to diminish the support and, of course, the spacesuit/lab coat-type people.

Let me give you some numbers. And I'm pulling these from these charts.

Secretary O'LEARY. I understand, yes.

Mr. KNOLLENBERG. In 1996, fiscal year 1996—and this is EM only, and I'm concentrating on the EM—it says at Rocky Flats

there are 1,643 spacesuits. That's 34 percent. There are 1,590 business suits. That's 32 percent. And you're certainly welcome to these figures. They come off the sheet.

Secretary O'LEARY. Yes, I have them. Yes, I have them.

Mr. KNOLLENBERG. Lab coats, 1,667—that's 34 percent, or a pretty close total of 4,900, which kind of equates with the numbers that we thought we had down before we heard Mr. Grumbly make his comment.

Now let's look at fiscal year 1997: Rocky Flats, spacesuits, 32 percent; business suits, 36 percent, up 4 percent, and the lab coats are 1,334, or 32 percent. So really we're losing the spacesuit/lab coat side of it, and we're increasing the administration, the business suits.

So if we're going to get where we want to get, I've got to believe that we have to have more money—we're talking dollars here—going into hands-on management, hands-on control. Maybe there's one way that we could economize, and that's what we're trying to do. We're not trying to minimize safety or security. We have a concern about that.

And I just would like your reaction as to—and these numbers, as I say, don't, again, they don't lie, but they're on this sheet of paper. And I think that we would like—certainly, I would specifically like—to see some clarification on those numbers, because it points to something a little different than what we're hearing.

Secretary O'LEARY. Well, I would say the reason I indicated—and I meant not to be frivolous at all—to you that I was not comfortable with those descriptors is because I don't believe the refinement in describing the jobs and the classifications at the site are as——

Mr. KNOLLENBERG. The total number—the total number is the big thing here.

Secretary O'LEARY. Yes, I'm understanding that, but——

Mr. KNOLLENBERG. That's the global thing.

Secretary O'LEARY. Yes.

Mr. KNOLLENBERG. We can talk about how you want to break that down, and I appreciate that——

Secretary O'LEARY. Okay, if you'd just let——

Mr. KNOLLENBERG [continuing]. But I think that——

Secretary O'LEARY. If you could just let me finish——

Mr. KNOLLENBERG. I will.

Secretary O'LEARY [continuing]. This thought: and that's the reason that I'm not comfortable with your definers, nor am I comfortable with our ability to meet your definitions. At this point——

Mr. KNOLLENBERG. Well, let me put forth this——

Secretary O'LEARY. I can't see that from here.

Mr. KNOLLENBERG. It's your list.

Secretary O'LEARY. But what I'm saying to you—no, I think I'm not expressing myself very well—it is the classification work with which I am not comfortable.

Mr. KNOLLENBERG. I fully appreciate that.

Secretary O'LEARY. Okay. So agree that you and I are——

Mr. KNOLLENBERG. You and I can disagree on that. I don't have any real strong battle about that, but let me just make sure that we understand each other. We're talking about total numbers here,

total numbers, global numbers. They don't lie. You can put them all into spacesuits, if you want to, and if you would tell me that and that was your authentic answer, I'd believe you. But if that's not the case——

Secretary O'LEARY. You wouldn't want me to if they——

Mr. KNOLLENBERG. I wouldn't want you—of course, I want to get to the bottom of this——

Secretary O'LEARY. Exactly.

Mr. KNOLLENBERG [continuing]. And I think we should be on the right track——

Secretary O'LEARY. Yes.

Mr. KNOLLENBERG [continuing]. With finding out specifically who is in this category. You can define your own categories.

Secretary O'LEARY. Fine. And what——

Mr. KNOLLENBERG. I want to see the numbers come up——

SUPERVISOR TO EMPLOYEE RATIOS

Secretary O'LEARY. What I'm attempting to say to you is that on the day we arrived at the Department of Energy the ratio of supervisor-to-employee was outrageously out of kilter with any real-world example that I knew, and that your descriptor of the suits is not necessarily mine because they don't all wear them.

Mr. KNOLLENBERG. That's fine.

Secretary O'LEARY. Since we have arrived—I don't have the number for Rocky Flats in my head, and I should—I can tell you that the field has done an extraordinary job in improving that ratio, and, if you will, reducing the so-called manager, the person who overviews and gives permission. We may not be doing that at the rate that you would like. I spoke to Tom Grumbly, I think it was the night before last, about the question, and he didn't think he could answer it accurately. But I will tell you this: he now understands because he took the assignment himself from you, to be able to quantify more carefully. But against the measures that we have, we have made dramatic progress in reducing the numbers of managers, and we're not finished. My goal is 1-to-15, and the private sector is about 1-to-11. So that's these people on that target, and they know it. They're measured on a quarterly basis.

Mr. KNOLLENBERG. My time has expired. I'll get back to it the second round.

Secretary O'LEARY. Fair enough.

Mr. KNOLLENBERG. Thank you very much.

Mr. MYERS. Thank you. Mr. Fazio, 10 minutes, please.

Mr. FAZIO. Thank you, Mr. Chairman. I'm going to have to leave and won't get a second round. So I'm going to have to put a good deal of my questions in the record.

But I first wanted to say, Madam Secretary, I wanted to congratulate you, not just on your presentation, but on the underlying administration of the Department, which I think has been very positive and generally successful and, sadly, overlooked because of all the furor over travel and that unfortunate press survey earlier in your tenure. I think you're on the right track on a whole range of issues, and I wanted to give you encouragement.

Secretary O'LEARY. Thank you.

OIL IMPORTS

Mr. FAZIO. I wanted to point out to my colleagues an article that is in this month's Atlantic Monthly—it's the April 1996 edition—called "Drifting Toward Disaster." And it's really a reminder as to what the Department of Energy was created for, among other things, and that is to deal with the burgeoning increase in our imports of oil. In fact, this morning I heard that our balance of payments had reached a new record high, and, of course, the major contributor to that was imported oil. Some have said if we did away with our problems with auto parts and autos and imported oil, we would have a trade balance of an equal import/export.

So I guess what I'm asking you is, given the fact that the country is not into energy taxes and given the fact that we're not into any further regulatory efforts to conserve energy, and given the fact that this seems to be the easiest thing for us to absorb to keep inflation down, a policy that the Fed and everyone else seems to pursue, to the extent that growth is a secondary concern, what is the Department's budget doing to anticipate this disaster that we're drifting toward? What is it that we might be able to do to avoid the kind of energy crisis of the seventies and the inevitable economic shock that that incurs to bring about in our economy?

Secretary O'LEARY. Well, the article within that magazine, authored by Charles Curtis and Joseph Romm, I think point to it in a very eloquent and a very well-thought-out way with lots of citations from other experts. The only way to get after this problem is, of course, to continue to support the development of diverse supplies of energy. That really does mean the traditional energy budget, which includes the work in fossil and nuclear, and especially in alternative energy. These need to continue. Every time we strip away an investment in technology to deploy these new diverse energy supplies, we may put ourselves in a position to be beat out of these markets by others.

I can cite you a very quick example. In the area of photovoltaics—and I just happened to be in Siemens in California last week and celebrated with them the accomplishment of the production of some 100 megawatts of solar power from photovoltaics, which is being deployed internationally. About 50 percent of their market goes to international marketplaces, and the requirement there is to change the policy so that it's easier to get it in at a profit.

This is a good story. It's a success story. With respect to wind technology, the same numbers of kilowatts are dispersed worldwide, but only 10 percent of that marketplace belongs to the United States of America. Occasioned by the fact, interestingly enough, that the Danes have beat us almost at every place in every country where that technology can be deployed by arriving first with, quite frankly, better technology 10 years ago than we have today. More importantly, with tied aid; that is, concessionary loans and other grants to move their technology away. If we do not meet this competition in the marketplace, when the next crisis arises, if these are the replacements for fossil energy, particularly petroleum, then we will have lost another market, and we'll also have deficits in our trade balance in these areas where the United States is now known

to be the technological leader. And I hear this from everyone who comes to visit, I mean other energy ministers that I see both here and when I am out.

So we need to continue these investments, and that is to continue as well in the area of fossil, where we have a requirement to continue, especially with respect to gas. I work with the more marginal producers, who I think are here represented by every State. Most importantly, we need to continue the work in nuclear, so that we can finally deploy by completing the licensing process, the light water reactors that are so close to license.

ENERGY RESEARCH AND DEVELOPMENT

Mr. FAZIO. Given the inevitable down trend of discretionary spending in the budgets that we're considering, whether our priorities are tax cuts or entitlement preservation, do you think there's a realistic assessment of the potential of energy R&D investments? My sense is that your budget inevitably is shifting more in the direction of cleanup and dealing with the nuclear stockpile. The budget that the Congress is likely to allocate to this committee is continually shrinking in that regard as well.

So what do you think your budget represents? Is it the best under the circumstances or are you really stretching the outer edge of this envelope? I mean, do you think there's more that could be done or do you think your leadership in this regard has been sufficient?

Secretary O'LEARY. Well, I said to the chairman some time ago that we'd never admit to being perfect or as successful as we wanted, as we could be. I think you've phrased it quite correctly. I must now do it much more carefully. To tell you that the budget before you represents the balance of any number of priorities within our administration; in short, to energy efficiency and renewable, I think recognizes the marketplace for the 21st century and is appropriate. In another world at another time, if I were in charge of the universe, of course, I would have put more to this universe. Sadly, I am neither—it's neither the other world nor am I in charge.

I think what we have here is, with a number of constraints well understood, a balance that attempts to do the very best. And it has, quite frankly, counted on some investments in the longer term on the fossil side that more nearly meet the requirements of the marketplace. Much of the work that gets done in the energy efficiency area addresses these issues. I mean the putter that I brought with me represents a reduction in energy cost for manufacturers in the United States, and it gets toward the demand side. It does not get to supply. We need to attend to the supply side.

But the worst thing would be if this committee wrestles with its options, and it considers whether you take care of the immediate and the more obviously human requirements, to miss this coming—you know, I hate to call it a crisis because I have been here before when others have called it a crisis, but this is a simmering, festering piece. And, you know, we can almost quote from almost any article; if you like, that in the next 20 years or the next 50, the growth in population 25 to 40 and then 50 percent. This carries with it tremendous implications for energy use, as people move out of urban areas in developed and growing countries into the cities.

And we cannot meet that demand against the plans that now exist for the Nation. But people do not attend it because it appears to be too distant.

DEFENSE PROGRAMS INCREASES

Mr. FAZIO. Well, let me move from there into discussion of some elements of the budget that are showing growth, for example, as a result of NIF and the tritium production element of your budget. We see an increase from $3.5 to $3.7 billion, and yet in the outyears it's going to be particularly difficult to complete those projects with the kind of budget ceilings that I think we can all anticipate. I'm obviously supportive, and I'm wondering, you know, where we go to get the bucks to do all the things that we all know we must do?

And I'd like to hear you on NIF because, frankly, I think there is a real question in this committee, and I'm sure there will be a floor battle on this issue this year. We seem to be of differing minds about it. Some people have seen it, and I believe it to be the case, that this is a major step forward for stewardship of the stockpile and for putting an end to nuclear proliferation or testing. At the same time I think there are many Members who have over the years shown a great deal of sensitivity to that issue who are not yet convinced.

I wonder if you could comment on how you will go about making clear the variety of reasons why the Department supports these increases in funding, and specifically that particular outlay.

NATIONAL IGNITION FACILITY

Secretary O'LEARY. I'm thinking, as you talk, about a very private conversation that I had with my Deputy. I could not share it here because it would be impolitic, and I think I would also have wandered into the area of classified material.

But let me say this, and it is not going to get directly to your answer, but it's a story that needs to be retold. I was at the Joint Session of Congress when President Jacques Chirac of France made his address some two days after he had announced the cessation of nuclear weapons testing. Many of the Congress were not there. Many of the Cabinet were not there. We needed somehow to have France understand that we as a Nation were not pleased with that activity to test. I thought about how ironic, it was because two years ago we were on a course in the United States to be boycotting ourselves, because that decision was almost imminent.

What the National Ignition Facility does for us is it gives us the ability to assure the military, who needs to be assured, that the business of certifying that the machinery of the weapon—that is, the warhead itself, aging and deteriorating, with so many parts—can be relied upon. This requires computing; and it requires the answering of questions that simulate nuclear-critical conditions without approaching them, so that the military has certainty that warheads that they may have to call upon are ready.

In my mind, the cost for the NIF is not too high. If you balance it against the cost of continuing to make weapons, which was a right decision for the United States to make, and if you balance it

against funds to be spent in that endeavor, then it was for me not a difficult choice to make.

I need now to say this: with respect to the outyears, you're quite correct, we have a problem. I need you to know, and the entire committee to know, that the outyears as portrayed were not discussed with any senior person at the Department of Energy. I believe that they were put together very quickly because of the very nature in which the budget was drawn this year.

As you can well imagine, once they were displayed to us, especially with this critical requirement, and our compact with our colleagues at the Department of Defense to provide the technology to forego testing, did we rattle many, many cages on a Monday morning after that had been done over the weekend.

You might notice on the outyears an asterisk which pretty much admits to the fact that there is still work to be done on this issue. That asterisk has language attending it which I read to say "not coming from the Department of Energy's budget necessarily." So we have much more work to do on the outyears. You need to know that I understand what I have now to do. I'm careful to accept any help that can be offered of this committee or anyone.

Mr. FAZIO. Well, I think the need for additional attention here is not only obvious, but timely, given the fact that we're usually one of the first bills out of the box onto the floor, and these kinds of issues will be exploited by people who may have other agendas, but who will take advantage of vulnerability whenever seen.

Mr. Chairman, do I have any time left? This is sort of a subjective judgment I'm asking you to make.

Mr. MYERS. Why don't you take another five minutes because you're not going to be back.

HIGH ENERGY PHYSICS

Mr. FAZIO. Well, I don't know that I'll take that long, but I did want to ask about high energy physics.

Mr. MYERS. I'm sure it would be okay with the rest of the committee.

Mr. FAZIO. Well, I'm not so sure, but I appreciate your giving me the latitude.

I did want to ask just about where we're going. You know, the SSC and this committee have had a long relationship, and the Drell Commission has come along and been empaneled to help us through the next few years at least as it relates to a HEP program. And I'm wondering if you would comment on the recommendations of that entity and that's affected both Fermi Lab and SLAC's budget in this year? I think it seems very important for this committee to try to get a feel for where we're going in this very crucial area that traditionally has had a good deal of support from this committee, but which some people think is adrift at the moment.

Secretary O'LEARY. I appreciate your giving me the opportunity to respond to this question. I need to say now, looking to Mr. Frelinghuysen from New Jersey, that where we've come in this high energy physics program is not a place I would like us to have come. I lament very much leaving the Tokamak unfinished, unaddressed. I think later in the exposition that you laid out for us we will tend to regret that.

That having been said, I live with the realities of not only the will of this Congress, but, you know, of our administration generally, because this was a piece that was done by many hands, not just one.

Having said that, the investment now in the general program for the basic science of high-energy physics remains in my mind the most important thing we can do to have the community—Martha Krebs will know I've been with her too long because she always calls it "the community"—[laughter]——

Mr. FAZIO. You haven't said "stakeholder" all day. [Laughter.]

Secretary O'LEARY. No, I haven't—have the community, especially in high energy physics understand that we now have to invest in the basic program and continue to turn out the good science and the right answers.

With respect to SLAC and the B-factory especially, on line and on time; with respect to Fermi Lab, again, investments made in those programs are to deliver both the scientists and, perhaps equally important, the equipment and the technology with respect to the accelerators that we have committed to do. We are on budget; we are on line to deliver on time, as we have committed.

Now is this the most stringent budget that we could have come up with? No, and I believe that the committee in its advice especially to Dr. Krebs gave us the opportunity to stretch ahead. Would I have liked that to have been more? Yes, because it makes it very difficult for me now to talk to young people about investing their careers in science and technology, especially physics, not understanding what the plan for the 21st century is. But I think we've got a job to do in educating the broader public. My concern is not with this committee; my concern is that the public has not yet understood why we make these investments. Martha Krebs has done an excellent job in attempting to communicate that message. I carry some of that weight, and I intend to do more to determine how the budget ought to be spread out. We've got a lot of work to do.

Mr. FAZIO. Thank you, Madam Secretary. And, Mr. Chairman and my colleagues, thank you for the additional minutes.

Mr. MYERS. Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Madam Secretary, good morning.

Secretary O'LEARY. Good morning.

CORE MISSIONS

Mr. FRELINGHUYSEN. I just wanted to focus for a few minutes on the Department of Energy's mission. The chairman somewhat alluded, but didn't pursue it too much in his initial comments, that the Department seems to have more missions each and every year.

You have four basic core missions; right?

Secretary O'LEARY. That's correct, sir.

Mr. FRELINGHUYSEN. And they are?

Secretary O'LEARY. Science and technology, which is at the heart of it——

Mr. FRELINGHUYSEN. Yes.

Secretary O'LEARY [continuing]. National security, environmental restoration or cleanup, and, what we call, our energy security work, which is all of our energy resource work.

Mr. FRELINGHUYSEN. And now, from looking over your budget documents, we're getting into promoting energy exports, improving U.S. industrial competitiveness. Are there any others that you might want to say are some new priorities?

Secretary O'LEARY. Well, let——

Mr. FRELINGHUYSEN. It's confusing to me because I have your materials here. Last year you had these four. I don't believe economic productivity was highlighted. I don't have any problem with it, but I'm wondering what's going on here.

Secretary O'LEARY. Yes. We had it last year, and we, in point of fact, have had it every year that I have worked in the Department of Energy or Federal Energy Administration.

The work with the industries has always existed. The reason we talk about economic productivity is because energy cost plays such a big part in the economy, and I have really worked very hard to understand how we measure how well we do our work. If we're not improving the productivity of the American economy as we do our work in energy conservation, by reducing the cost of the steel miller or the foundry man, then I don't believe our investments are wise. And I think we ought to be able to measure those. So that is not a new mission.

INTERNATIONAL ENERGY TECHNOLOGY

Now the new mission that you spoke to is one that I did not embrace. It's one that the Congress gave to the Department of Energy when the National Energy Policy Act was passed in 1992. It directed that the Department undertake the work of attempting to deploy energy technology internationally. I believe that was a wise decision because energy growth will occur in the majority of instances outside of the United States to these expanding energy markets. If we simply tend to selling our wares at home, we will miss a marketplace that's worth $4.1 billion, not my figure, but the figure of others, by 2010. To sit at home and not go after that when so many others do is to me a mistake.

And I would say that the Chairman alluded to the fact that he believed that I might be doing the work of the Secretary of Commerce. I will tell you the work of energy deployment has to do with helping newly-privatized industry, which had prior to fore been State managed, understand what the attractors are to invite private investment, so that U.S. firms may not only go there, but flourish, because we brought private sector funding with them.

So this is the work that we have been mandated to do by the Congress. I didn't walk in and say, gee, this would be a good idea to do.

Mr. FRELINGHUYSEN. Well, in a time where, by everybody's admission, we have shrinking resources, many departments are being asked to take a look at their mission and redesign it. And I must say I get the definite feeling from reading the newspapers and the documents that the mission of the Department of Energy seems to expand. I can appreciate your enthusiasm, and I quite enjoy listening to you because I think you have very firm convictions, but I do

get the feeling that we're trying to do a lot of things simultaneously here and that in some ways the core missions seem to be taking a back seat, but maybe that's a wrong impression.

Secretary O'LEARY. I need to point out to you in the exposition that I gave of reduction of staff and expenditures in the Department, you would, I hope, come away with the impression that I have been very serious about cutting costs and managing the Department of Energy.

More importantly, in this international work we do not leave behind issues involving national security. It is not without consequence that I have been to Russia four times in my tenure. On all but one of those occasions, I have been in the presence of the Vice President of the United States. All of the work we've done in nonproliferation in the Russian Federation and former Soviet states results from those exchanges and my very personal work with the Minister of Atomic Energy, Victor Michailov. It is not by accident that I was in China, nor that we work with the Chinese and try to come to closure, so that we might sign an agreement for the peaceful uses of nuclear weapons.

So these issues do tie together. Nuclear energy is part of the energy business, and the nonproliferation that flows from it is also a part of my business. It is not by accident that I was in Pakistan and Turkey, part of the subcontinent of Asia where we have the greatest concern about nuclear proliferation and where I now have a set of excellent ties which enable me to do work that I believe I could not otherwise do, if I were not the Energy Secretary coming on other business.

I need you to understand that we take very seriously this responsibility to cut costs and to do it with some care. I also point out to you that, by not my measure but by anyone's measure, we have reduced our budget more than any agency in the Federal Government.

DOE EMPLOYMENT

Mr. FRELINGHUYSEN. Well, let's talk for a minute, if we can, about your projected employment levels for the fiscal year 1997. There are approximately 18,484. The numbers indicate that 37 percent of the employees are located at headquarters and approximately 63 percent are in the field. If the Power Marketing Administration's and FERC's employees are removed from this mix, the total number of DOE employees would be approximately 12,000 with 44 percent located at headquarters and 56 percent in the field.

Can you explain to me why the Department, which has an extensive structure of field offices with, I may add, full services, who actually manage the contractor-operated facilities, needs such a large staff percentage at headquarters?

Secretary O'LEARY. I agree with you that we don't need as large a management staff and, as I earlier testified, I've begun to address the issue of reducing the number of managers, not merely by location, but also to try and deploy people to the field or simply let those folks go. You will see, as we move down that trajectory of reducing positions at the Department of Energy, that those will be the managerial slots. This is a piece that I believe we have been very successful in accomplishing over the past 13 months. You will

see more of that success as we begin to come to the end of the fiscal year.

The people who are being hit—and it is very painful for them as individuals—tend, to be the much more senior people and those who are managers. So I understand the concept. I brought it with me from the private sector. We are doing it piece by piece. I am trying to do it without a RIF, which means we take advantage of the authority we have to offer early outs and we encourage those retirees who are eligible to retire to do so, because to undergo a RIF at the federal Department of Energy headquarters will likely disturb all of the work of every unit within the Department of Energy because of the structure——

Mr. FRELINGHUYSEN. But, to answer my question, we are moving toward having more people out in the field and less people in headquarters?

Secretary O'LEARY. That's correct. What you will see, I'm sorry that I have not pointed to exactly what you need to hear—you will see more people simply coming off the rolls at headquarters as well.

Mr. FRELINGHUYSEN. The budget request for your office declined, as I understand, 15 percent because, in the words of your own budget documents, there are fewer full-time equivalents and there were office efficiencies?

Secretary O'LEARY. Yes.

PROGRAM DIRECTION ACCOUNTS

Mr. FRELINGHUYSEN. I understand that employees in program offices work in the Office of the Secretary, but are funded out of program accounts. If that's the case, how many employees in the Office of the Secretary are funded by program accounts? I've read this; I've heard it from people.

Secretary O'LEARY. I'm not aware that——

Mr. FRELINGHUYSEN. You're not aware?

Secretary O'LEARY. No, sir. And I'm trying to think. I don't think there's anybody in my office who works for someone else. Actually, I have tried to provide the leadership there and ensure that I'm not doing what others are doing. I will now go home and check myself, but I'm not aware: I know all of the people who work for me. I don't know anybody who's on detail from someone else's office.

Mr. FRELINGHUYSEN. All right. So nobody in a program office is working in your office——

Secretary O'LEARY. Not that I know of.

Mr. FRELINGHUYSEN [continuing]. To supplement your staff?

Secretary O'LEARY. Not that I know of.

[The information follows:]

EMPLOYEES WHO PROVIDE SUPPORT TO THE OFFICE OF THE SECRETARY, UNDER SECRETARY OR DEPUTY SECRETARY BY ORGANIZATION

The attached table depicts employees whose positions are funded by Departmental program elements and who provide support directly to the Secretary, Under Secretary or Deputy Secretary in accordance with or in addition to the duties and responsibilities in their official position descriptions.

Name	Parent Organization
Sheila L. King	Office of Civilian Radioactive Waste Management
Madelyn R. Creedon	Office of Defense Programs
Vicky E. Sinkler	Office of Defense Programs
Daniel M. Adamson	Office of Energy Efficiency and Renewable Energy
Robert H. Annan	Office of Energy Efficiency and Renewable Energy
Ervinia J. Brown	Office of Energy Efficiency and Renewable Energy
Peter Fox-Penner	Office of Energy Efficiency and Renewable Energy
Robyne Johnston	Office of Environment, Safety and Health .
Susan R. Lord	Office of Energy Information Administration
Michael L. Telson	Office of Energy Research
Janet M. Anderson	Office of Environmental Management
Jeffrey C. Crater	Office of Environmental Management
Mark D. Fallon	Office of Environmental Management
Ellen A. Livingston-Behan	Office of Environmental Management
Robert L. Terrell	Office of Environmental Management
B. Karen Wnukoski	Office of Environmental Management
Rodolfo F. Arca	Office of Human Resources and Administration
Vickie L. Bandy	Office of Human Resources and Administration
Bruce E. Campbell, III	Office of Human Resources and Administration
Juanita M. Doggett	Office of Human Resources and Administration
Andrea M. Esquer	Office of Human Resources and Administration
Nicole M. Giannini	Office of Human Resources and Administration
Margo W. Payne	Office of Human Resources and Administration
Reginald E. Sellers	Office of Human Resources and Administration

James N. Solit	Office of Human Resources and Administration
Shani L. Watts	Office of Nonproliferation and National Security
Dawn M. Schrepel	Office of Policy

Note: This does not include Thomas P. Grumbly, the Acting Under Secretary, nor Dan W. Reicher, the Acting Chief of Staff. Both of these employees are currently funded by organizations other than the Office of the Secretary; however, their permanent appointments to the positions in which they are Acting, are currently pending. Once appointed, they will be funded from the Office of the Secretary.

PROGRAM DIRECTION

Mr. FRELINGHUYSEN. There are significant increases in the program direction accounts for many programs, even some programs that are being reduced. Can you explain what activities are funded by program direction and the reasons for these projected increases?

Secretary O'LEARY. Heretofore, much of the administrative and support work, such as equipment, Xeroxes, all of the business to simply keep an organization afloat, was lodged in other accounts. I believe quite correctly, we were directed last year to reflect all of the costs for support of individuals within program director accounts. That is occasion for some of the increase. In the previous years we had been living off of nonexpended balances to service those accounts. We have, at the direction of this committee and taking advice from GAO, quite frankly, gotten rid of all of those accounts where we were carrying extra money, except against contracts that are come due and owing.

So that is the reason for the account, and I can very critically tell you what else is in the program direction accounts in case I have missed something. I think I've very well covered what it's in the account. It's salary, it's travel, it's benefits, and it's supplies and Xerox machines, and the thing we were doing without here of late, stuff that you use in the ladies' room and the men's room, simply because we had a real shortfall.

Mr. FRELINGHUYSEN. Well, if that's not a document we have, I would certainly request that——

Secretary O'LEARY. No, this is simply a comparison of program directions, and I'm pleased to give it to you.

Mr. FRELINGHUYSEN. If we could have that——

Secretary O'LEARY. Sure.

Mr. FRELINGHUYSEN [continuing]. If you could give that to the Chair, that would be wonderful.

Secretary O'LEARY. Sure.

Mr. FRELINGHUYSEN. Thank you.

Secretary O'LEARY. But this is not the detail you were looking for. I'm happy to hand it to you.

Mr. FRELINGHUYSEN. Okay, thank you.

Secretary O'LEARY. Here.

[The information follows:]

Comparison of Program Direction

Salaries and Expenses

SUMMARY ENERGY AND WATER DEVELOPMENT BY ORGANIZATION	FY 96 Appropriated	FY 96 Estimated Actuals	FY 97 Requests	FY 96est.-97 %Change
Energy programs				
Energy Efficiency and Renewable Energy	14,317	16,127	17,742	9 10%
Nuclear Energy	20,807	25,750	25,752	0.01%
Civilian Radioactive Waste Management	29,321	29,321	30,509	3.89%
Power Marketing Administrations	412,192	414,087	414,541	0.11%
Total, Energy Programs	476,637	485,285	488,544	0.67%
Science and Technology Programs				
Energy Research	54,354	54,354	53,754	-1.12%
Office of Scientific and Technical Informat	8,800	8,800	8,700	-1.15%
Technology Partnership & Economic Competitiveness				
Total, Science and Technology Programs	63,154	63,154	62,454	-1.12%
Weapons/Waste Clean-up Programs				
Defense Programs	326,933	326,933	334,404	2.23%
Nonproliferation and National Security	82,809	82,809	95,622	13.40%
Surplus Fissile Materials	3,582	3,582	3,633	1.40%
Worker and Community Transition	4,329	4,329	4,341	0.28%
Environmental Management	473,751	487,094	454,172	-7.25%
Naval Reactors	18,530	18,530	18,902	1.97%
Total, Weapons/Waste Clean-up Programs	909,934	923,277	911,074	-1.34%
Secretarial Support Organizations				
Environment, Safety and Health	51,081	51,081	49,752	-2.67%
Departmental Administration	191,442	197,980	206,101	3.94%
Inspector General	28,516	31,817	30,502	-4.31%
Total, Secretarial Support Organizations	271,039	280,878	286,355	1.91%
Field Management	112,915	116,695	121,723	4.13%
TOTAL, ENERGY AND WATER DEVELOPMENT	1,833,679	1,869,289	1,870,150	0.05%
Total FTE's	15,795	15,795	15,179	-4.06%

Notes:

- The FY 1996 estimated requirement is nearly $34M more than the appropriated amount due to the planned use of prior year balances.
- The FY 1997 funding request is roughly level with the FY 1996 estimated requirements since the reduction of 616 FTEs is offset by the FY 1996/7 pay raise of 3% ($55M).

COMMITTEE RECESS

Mr. FRELINGHUYSEN. Do we have five minutes? I'd like to ask some more questions. Or should we go vote and come back?

Mr. MYERS. We'll go vote.

Mr. FRELINGHUYSEN. Okay, thank you, Mr. Chairman. Thank you, Madam Secretary.

Secretary O'LEARY. Certainly.

Mr. MYERS. The committee will stand in recess for about 20 minutes. We have two votes on the House floor, and if you have anything you need to take care of for the next hour, this might be the time to do it.

Secretary O'LEARY. Thank you.

[Recess.]

Mr. MYERS. The committee will come back to order. And we apologize for the inconvenience to our witness, as well as those in attendance here, but that is our constitutional responsibility, to go over and vote when it's required. And we also have a conference with the other body on two issues, on a temporary CR to run the country for two weeks and also, hopefully, to try to get one that runs the country until the end of this fiscal year. The first one is a requirement; the second one is hopeful. We'd like to see that, but it's not likely that it would happen. But, in any event, thank you for waiting for us.

Mr. Chapman?

Mr. CHAPMAN. Mr. Chairman, I think—I know we're working for the Guiness Book of World Records on number of CRs, so it's setting a record this year perhaps we'll never have to worry about anyone breaking.

Madam Secretary, good morning.

Secretary O'LEARY. Good morning.

ENERGY CRISIS

Mr. CHAPMAN. It's good to see you.

And I'd like to, if I may, get back briefly to that issue that Mr. Fazio was talking about. And reading that Atlantic Monthly article is something that you scratch your head and think, well, gee, these folks within DOE are—or at least there is some school of thought within DOE that agrees, I think, with a lot of us. Not just on the issue of, have we really been smart about how we're managing or planning for perhaps what may become another energy crisis; if not a crisis, certainly something that can create problems for us in the future. But I thought the analysis that it is going to be very difficult to do anything from the standpoint of planning for that, if, in fact, it is coming, if there is going to be a coming oil crisis; that the current environment, both on budget and the view toward taxes, and so on, is not likely to be one that either realistically or politically gives us a great deal of flexibility. And then the argument is then made: so why in the world aren't we at least investing in the research, allowing DOE to do—or, in fact, encouraging, insisting, if you would—DOE to perform its traditional role in trying to select investments in those technologies, in those research projects, in a whole variety of ways that historically have been done that also have historically proven to be enormously beneficial?

I have a two-part question really. I'd like to know if, having sensed from your exchange with Congressman Fazio that you have read that article, whether or not you agree—whether you've read the article or not, whether—

Secretary O'LEARY. Oh, I have.

Mr. CHAPMAN [continuing]. Whether or not you agree that, in fact, there is a possibility, if not a probability, that we could face that kind of crunch or crisis in the future. And, two, I'd like to have your personal view as Secretary of Energy as to whether or not we are, in fact—and I understand there is a balance that we must reach, but whether or not the general view reflected in that article that we are foolish not to invest in increased R&D in a whole host of areas, whether or not, in fact, that is your view?

Secretary O'LEARY. Oh, absolutely, it's my view. I have certainly thought that I have so testified every year I've had an opportunity to talk about it.

The work I asked Daniel Yergin to undertake as a part of the Secretary of Energy's advisory board really portrayed all of those facts a year ago, when he and a committee of experts from the private sector, the oil and gas and renewables and academicians, came to the same set of conclusions in not nearly as tightly-written or as eloquent a way as have Joe Romm and Charlie Curtis. Yes, absolutely.

Mr. CHAPMAN. And do you agree with their assessment that, in fact, we're headed—that there will be a crisis?

THE GULF WAR

Secretary O'LEARY. I do, and I got some of my other colleagues in trouble about two weeks ago by so testifying at a hearing about three months ago. They got called up to testify, one of whom was Joe Romm, one of the authors of that article.

Yes, I do agree. In the time that I have to talk at leisure with people who understand the oil business, and from my own recollection, I know that almost any geo-political incident or an interruption of an important and crucial main pipeline can create the kind of problem that we last experienced during the Gulf War.

Mr. CHAPMAN. I'm one of those that wholeheartedly agree and think that, in spite of the protestations perhaps of the President at the time that that was about naked aggression, what that was about was energy. And it is important, I think, that those of us that understand a small piece of it—and I have some understanding, I think, of the oil and gas piece of it, the fossil piece of it, but there is so much more to the research effort. It is so much broader and offers, I think, enormous opportunities in a whole host of areas beyond just what we can do in the fossil area. Those are concerns that I have, as I sit here—and this will be the last time that I will have an opportunity to ask you questions as a Member of the House because I'm retiring.

And I reflect back on 11 years, and it will be a decade of those on this subcommittee, and there's not been a time that has gone by, a year that's gone by, an appropriations cycle that has moved through this Congress, that I have not been an advocate for and strongly supportive of additional research in this area.

And in this Congress, early in this Congress, I thought it was interesting; I sat, I guess, in this place and listened to a panel of people come up here, and it was really hard to sit and listen to them talk in terms of, if there was R&D that was worthwhile, the private sector would do it. And, literally, I heard one particular fellow sit probably where you're sitting and say that we had no need for our national laboratories; that those were efforts that belonged, if they belonged at all anywhere, they belonged to the private sector.

I was astounded and sat for as long as I could before I finally—"explode" is not the right word—but, finally, just said: what in the world would these folks from these right-wing think tanks and all these other, what I think are brainless idiots, come along and make suggestions that there is no appropriate role—and they were talking beyond DOE——

Secretary O'LEARY. I understand.

Mr. CHAPMAN [continuing]. No appropriate role for this kind of basic research or, particularly—certainly never a role for applied research and development at the Federal level. And I think that is a very disturbing trend that is reflected somewhat in some of the budget priorities, in the budget request and the budget initiatives and the appropriations bills we've seen come out of Congress. And, in my judgment, the fault lies not just with the current Congress, but I think there has been negligence that we can spread around in a bipartisan way.

So I just—one of the things I want to do today, sort of as a parting shot, is I hope that that view that you share and the energy that I hear that you put behind that view, I hope that's not anything that diminishes in the balance of your tenure at DOE.

There are those of us that strongly believe and share that there is, in fact, likely to be a crisis. It is likely to be terribly disruptive. It is likely to disadvantage this country in ways that are probably very difficult at this point to assess.

And the view presented in this article about the opportunity, in addition to the crisis, the opportunity we may miss—and most likely, they argue, will miss—and the tens of thousands, if not hundreds of thousands or millions, of jobs that can be created in the years ahead, if we just have the sense enough to make these investments now. I just want to encourage you to continue to be the strongest advocate possible, both within and without the administration, for the research that DOE has done at all levels in all areas, and tell you that, whatever role I may be in, I will be supporting those efforts and hope that you continue to do that.

Secretary O'LEARY. Thank you, Mr. Chapman. I will.

Mr. CHAPMAN. That said, let me be a touch more parochial. I must ask you a question about Pantex.

PANTEX

Secretary O'LEARY. Certainly.

Mr. CHAPMAN. Not in the scenic piney woods of east Texas, it's a little bit across the State. You were kind enough to respond to a letter I had written recently about one of the recommendations that has been made for the handling of high explosives component fabrication, and a recommendation that is currently out there that the mission should be moved from Pantex to the national labs. You

had indicated in your response to my inquiry that no final conclusion had been reached regarding the recommendation and no decision would be made until all of the relevant information concerning a whole host of factors—environmental, cost, technical, and others—had been completed.

And I appreciate very much that response. I did, for the record today, want to make a couple of points and ask a question, because it appears to me that, if, in fact, the recommendation as it currently exists, and that you must decide, should be followed, it seems to me that we would be recreating—and I might add at a significant cost to taxpayers—a function in another location that already exists at Pantex.

For example, I understand from the information we have that the incremental cost of performing this work at Pantex is about $3 million involving 51 employees. At Los Alamos it would be double that, $6 million, and require 65 new jobs, and at Lawrence Livermore it would be $8 million and 150 new jobs. And I am certainly interested in asking you, are you any closer to making a decision in that regard, and whether or not that information comports, the cost aspects, particularly, comport with what DOE's understanding might be?

Secretary O'LEARY. I should have given you a call last night, Mr. Chapman. The draft environmental impact statement for the sitewide use of Pantex will be released, I believe, on Monday. It may be released today.

I have always been clear that there was a preference on the part of the people who spend every day of their lives looking at this, to the co-location of this work nearby one of the laboratories who would be doing much of the work on the refabrication of pits that have to be, if you will, rehabilitated. Nonetheless, I am still clear to say that, without regard to their preference—and we have the right, of course, to select a preference—I will continue to look at this in a very balanced way.

The things that will drive me are these: one, not only the cost—and you have already indicated, as we both well know, that this work could be more cheaply done at Pantex—but what in the new requirements for science-based stockpile stewardship is the best place for the co-location of this facility?

I will leave you with this thought and this personal commitment: I recognize the value of Pantex. I believe in the work that we have already done. There's a clear and remaining mission for the site. As we go forward in appropriately aligning all of our facilities, as we look forward to a life without nuclear testing and the comprehensive test ban treaty, I am clear that the work that is being done there by excellent employees will continue, if not that mission, then certainly the mission in which they are more deeply engaged. This is a modest part of their work.

Mr. CHAPMAN. Well, more—and, also, I appreciate your comments. I agree, and also an important part of that, which seems to be more and more difficult to get these days, is the tremendous community support that they have for the work they do, not just for the employees that work there, but others as well.

So I do appreciate that commitment and hope that that mission can remain there and remain strong, and look forward to your continued attention to that matter.

Secretary O'LEARY. Thank you, sir.

Mr. CHAPMAN. And this is not a note with a pertinent question; this is a note that says I'm down to one minute. [Laughter.]

I thought, oh, there's some point, cogent point, here that I have missed that they asked me to make. This is a real simple message. [Laughter.]

So thanks, Jeanne. I love to see her blush [referring to a staff member].

Mr. Chairman, thank you. I think I'm out of time.

Mr. MYERS. Can you stick around for a second time?

Mr. CHAPMAN. I will stay as long as I can.

Mr. MYERS. Okay.

Mr. CHAPMAN. Thanks, Mr. Chairman.

NUCLEAR REACTOR DESIGNS

Mr. MYERS. Madam Secretary, many years ago, even before Mr. Chapman came on board, Mr. Bevill and I were promised that we would have a standardization of a reactor design that a utility could come in and buy one off the shelf, a reactor, and after siting approval, it would be pretty—a decision that they could get a license. Well, we're still not there. How soon are they going to get that accomplished? Even long before you——

Secretary O'LEARY. I understand.

Mr. MYERS [continuing]. At least three other Secretaries have made the commitment that we're going to standardize the design. So that would be a great hurdle, a great advantage to the utility industry to be able to say: this is one that has been licensed; it can be licensed and will be licensed.

Secretary O'LEARY. I'm in the position to tell you that we're on track. As a matter of fact, my colleague, Mr. Magwood, who is right here, last night signed a document with the partners on this work for this experimental design. It is on track. We are clear that we will have an engineering, complete engineering design for the AP–600 I know sometime in fiscal year 1998. I knew that. Thank you. I knew that.

Mr. MYERS. You knew the question would come, didn't you?

Secretary O'LEARY. No, I knew what——

Mr. MYERS. And isn't it strange how just a day or two before we have hearings so many things happen? [Laughter.]

Secretary O'LEARY. Well, no, I must tell you——

Mr. MYERS. Really, we've noticed that through the years, too, not only on your watch.

Secretary O'LEARY. No, no, Mr. Chairman, this has nothing to do with the hearing. No, no, no, it had something to do with a great disagreement between three of the partners, especially for the AP–600. There's been a willingness for us to sign this contract for the next phase of this work. The work had been ongoing with the signed contract. I'm grateful to Mr. Magwood for getting this done because I needed it done to keep my commitment with others, not necessarily you, though I try to keep those commitments.

But the point I need to make to you is that this is a vigorous program in which I am personally engaged and spend time on it and with it. The most important thing is that, when we get this prototype, it is likely that the opportunity for selling it will be outside of the United States, which is the thing I want to see happen.

Mr. MYERS. That was my next question.

MARKETS FOR A STANDARDIZED REACTOR

Secretary O'LEARY. Yes, which is the thing I want to see happen, which is why I am busily engaged in the work that I do in the places that I have mentioned earlier. There is a market for this technology. We want to meet that market and not have the French beat us out.

Mr. MYERS. So this committee next year, minus Mr. Chapman, Mr. Bevill, and me, you can tell them we've got one approved; all we have to do is manufacture it?

Secretary O'LEARY. Well, we'll be in fiscal year 1998, I think about the middle of that year, certainly before the end of that year, we'll be ready. We will be moving forward with the NRC work for licensing, yes. We are almost there. This is work that many others have done. It's just been aggressively moved by this team.

Mr. MYERS. Well, now the advanced light water reactor we're talking about here has been worked on for at least five years.

Secretary O'LEARY. That's right.

Mr. MYERS. And so you think that we're that close, then, for a prototype?

Secretary O'LEARY. I know we are, yes, sir.

Mr. MYERS. And is there a market? Unfortunately, it appears that there is not going to be a market in this country for the foreseeable future, but, hopefully, we'll catch up or we'll go back into business again and let the rest of the world prove it.

But there is a—I don't mean—you have seen more of the market than some of us have. I don't mean to imply anything here, but is there a market for these?

Secretary O'LEARY. Yes. Well, I think you should imply that because I believe very strongly it's important for me to know and understand that market and know the people who make decisions about the technology to be purchased. So, yes, there is. In China, in Eastern Europe, for all of Asia, there is a growing and a vigorous market for this technology. We want to be competing because, if the U.S. industry, the nuclear industry, is not viable through its sales abroad, then upon the condition of need in the United States, we will buying from others. We will be in the same position for nuclear power as we find ourselves for petroleum. It makes no sense to me.

Mr. MYERS. I've got another question. I'm glad you said that. Pretty soon I've got another question I want to ask you about in buying from others.

Well, I am pleased to hear that, and I hope this is true. And I hope that someday we will be buying again, but, if I were a CEO of a utility, I certainly wouldn't be interested today with the difficulty we have in getting a site approved, let alone the reactor itself, but this is good to hear, that we are.

But the problem—and, here again, I'm not reflecting that you might not necessarily be here next year, but we know we're not going to be.

Secretary O'LEARY. I understood you wouldn't be, sir.

Mr. MYERS. I'm talking about you now.

Secretary O'LEARY. Yes. [Laughter.]

Mr. MYERS. It's a foregone conclusion I've decided not to voluntarily. But I'm not suggesting you're not going to be here, but that has happened. Mr. Bevill and I have served with seven Presidents, and we get just about to this point and the administration's changed, and then we start back to square one. And this is what—

Secretary O'LEARY. Well, I'm going to do my part to ensure that the administration doesn't change, sir. [Laughter.]

Mr. MYERS. But there is that risk, because we've seen it happen. We have served with seven Presidents. Not all of them thought they were going to change, either. I'm not suggesting—but I'd like to see this be continued after you and I are both gone, whether you stay another four, or whatever it might be. I know Mr. Bevill and I are not going to, and Mr. Chapman.

But I'd like to make sure it's firm in place, where that decision is going to be made, so we don't have to back up and start all over. It's not going to be the light water reactor; it's going to be some other reactor. So this is a thing—I've been a long believer——

Secretary O'LEARY. It's firmly in place now.

Mr. MYERS. I've liked the gas turbine reactor. I've always thought that that was the direction we ought to go, the modular, but you've never—your Department has never been very sold on it, and we, finally, are no longer approving or we didn't fund it last year.

Secretary O'LEARY. We're not funding it. That was a wise decision.

I believe that we are now funding and supporting to completion the technology for which there's a marketplace abroad, and later in the United States. I can assure you that the steps taken will lead to completion. Now I don't know what the next person will do who has the opportunity to occupy this seat, but I mean very seriously that I intend to work extremely hard to see that the President has the opportunity to appoint someone or continue someone in this job who has the same sense of responsibility about this energy source that I do.

Mr. MYERS. Well, I hope it's far enough down that track we spoke about a while ago, the two tracks, that it can't be sidetracked or backed up. That's the thing. Whether it's you or somebody else——

Secretary O'LEARY. I understand.

Mr. MYERS [continuing]. It's very necessary for the future.

Secretary O'LEARY. The Congress will have a great deal to say about this in terms of the funding for fiscal year 1998.

LABORATORY STATUS

Mr. MYERS. Well, labs have been mentioned here. We have, give or take one or two, we have about twenty-five national labs. We have had a lot of testimony that we can't afford that many labs. There have been several studies, the more recent one here that you

referred to a moment ago. What's going to happen? Are we going to continue just to cut down each one of those each year a little bit or are we going to concentrate on, like, three—you heard what we talked about yesterday, the defense labs. Three of them, how in the world can we afford three? You know, we're not—the emphasis isn't on defense weapons these days. So the number of reactors for the Navy, the naval reactors, is way down. Why do we need three labs for defense today, defense-oriented labs?

Secretary O'LEARY. Well, I want to remind, just for the record, that I commissioned Mr. Bob Galvin to do the study of our national laboratories because I thought I needed the help to attempt to cut costs. In that report, what the Galvin commission, with its other 20, I think 20, members said was they believed over time that one of the national laboratories could be excluded. I believe their intent was that it be sold or go to a new mission, it being environmental management, interestingly enough.

That recommendation was made before the administration made its decision to forgo nuclear testing and instead used as its proxy, science. When the President of the United States made the decision that he would bank on stockpile stewardship through science, he also made the decision that we required the three labs in order to do that work and to certify to the safety and reliability of the stockpile for the foreseeable future.

So, in that regard, that issue is closed to me. Quite frankly, it was a recommendation that I enjoyed making to the President. I believe we needed the tension between the two weapons design laboratories, Lawrence Livermore and Los Alamos, to ensure that we were not making errors in our calculation and in the certification that I have to make, and then the Secretary of Defense has to make, with respect to our stockpile. So that's No. 1.

With respect to the remainders, we continue to look at closing laboratories. We have closed or are on track to close one of our technical laboratories in Bartlesville, Oklahoma. There's one laboratory which is earmarked now for sale which is in Santa Barbara. I suspect that there are at least two others.

Charles Curtis heads for me this laboratory management committee. I mentioned earlier that Mr. McTague from the Ford Company serves as his co-chair. I will expect that they will have for my attention other candidates for laboratories that should not be closed, but should, frankly, be privatized. But by the end of this fiscal year, we will be well on the way to privatizing what in the agency is called PETC, and after that—that's the Bartlesville facility—and after that, I'm certain one in California and perhaps one in New York. So we are moving in that direction, but not the larger labs.

Mr. MYERS. It seems to me the big ones are where the big costs are, though, aren't they? It would seem to me that we probably have more labs, don't we, than all of the rest of the world put together?

THE IMPORTANCE OF DOE LABORATORIES

Secretary O'LEARY. No, but we certainly do have the best, by any measure that you would use in terms of Nobel prizes awarded in science and technology, in terms of R&D 100 awards, and, more

importantly, I believe, in terms of the technology that we now use to compete internationally. These are excellent labs.

Mr. MYERS. You met your counterpart in Soviet Russia.

Secretary O'LEARY. Yes.

Mr. MYERS. You've convinced him of that?

Secretary O'LEARY. Have I convinced who of that, sir?

Mr. MYERS. Michailov.

Secretary O'LEARY. Ah, well, I think that our laboratories are doing excellent work——

Mr. MYERS. I do, too.

Secretary O'LEARY [continuing]. With his. I believe in that regard he is very convinced about the value of collaboration with our labs. In fact, we have very rich exchanges with those laboratories, some of which will be the subject of a nuclear summit to be held next month between our two Presidents and the leadership of the other seven nations who—I'm sorry, there are six nations who are participating.

So there's real value coming out of those collaborations, some of that defense conversion, actually taking the military and the former Soviet Union as well and putting them to work at industrial outcomes. So, yes, I think he'd agree.

Mr. MYERS. Well, we didn't find him that way. In fact, I don't—between cigarettes, when he lit up, I did get a chance to say a word or two, but not much beyond that. [Laughter.]

Mr. CHAPMAN. Mr. Chairman, was this the fellow that we met together?

Mr. MYERS. A constant cigarette smoker, you know——

Mr. CHAPMAN. Yes.

Mr. MYERS [continuing]. In between martinis. [Laughter.]

Mr. CHAPMAN. Was he the one that rode on the Russian airplane that caught on fire while we were on it, though; that's the—that wasn't the same guy?

Mr. MYERS. No, he was smart enough not to get on that airplane. He put us on it. Then it caught on fire. [Laughter.]

Mr. CHAPMAN. One of my fondest memories of my years in Congress was being on an airplane that was on fire. [Laughter.]

Mr. MYERS. Unfortunately, I've been there before, too. [laughter.]

Mr. Knollenberg?

EMPLOYMENT LEVELS

Mr. KNOLLENBERG. One thing about Mr. Michailov he did do is he did the best he could for the American economy because he smoked about five packages of cigarettes in front of our eyes in a matter of a couple of hours. We sort of enjoyed that visit with him. [Laughter.]

Madam Secretary, just to point out one thing, the exact staffing levels that we were talking about previously, that's not my point. The point is more global. And what we're trying to do, I think, is to get a grip on some numbers that, obviously, in the end I think will help, we think, translate into some changes for you that will improve the situation and make this thing work.

We're obviously concerned about security; we're concerned about sunsetting this thing, too, and we want to find some ways that we can help. Now I would like to issue this challenge to you, though,

and to the Department: we'd like to have a little more information coming a little more quickly and more easily. We've been requesting this since December and we're beginning to get—it seems of late there's a better track or better flow of information coming to us, so perhaps we've turned a corner. That will help us and we won't be on your back about response if we can get some of that information. We aren't going to micro-manage what you're doing. It's just that——

Secretary O'LEARY. I'll attend to that personally to ensure that what you request will arrive in a more timely fashion, and I'll do that by making sure that your requests are passed through me on their way.

Mr. KNOLLENBERG. I would appreciate that.

Secretary O'LEARY. So I own that.

Mr. KNOLLENBERG. Thank you.

Secretary O'LEARY. Sure.

ENVIRONMENTAL CLEANUP COMPLETION

Mr. KNOLLENBERG. I want to talk just briefly about sunsetting. I know we've got Savannah River, we've got Rocky Flats, we've got Idaho, Oak Ridge, and on and on. In the BEMR report, which I recognize is only a guide—it's not the constitution by which you do your daily work, but it is a guide and it bothers me when I look at some of the prospective dates for sunset. We're talking about some of our grandchildren; some yet to be born may not be around when they finally get through with the projection that they've put together. I guess I'd like to get your impressions about when you think that we might see the sunset on Rocky Flats, on Hanford, on Idaho, as to how that can be achieved, perhaps with technology improvements, some internal improvements which you're in the process of doing, and just focusing more on the cleanup, so we can get out from under this thing that seems to overwhelm us at the moment.

Secretary O'LEARY. I think you put it just correctly. I've described the BEMR as really the challenge. It was the first effort that the Department ever undertook to capture closure dates for all of its sites. So, in and of itself, that set the benchmark that got people working. I would like to give you an example rather than just sit here and prognosticate what would be the close dates of each of these sites because you and I recognize that you probably wouldn't believe me anyway.

I would like to use as the example Rocky Flats, and I could use other of the sites as well. The individuals at the site, through their leadership, have taken the dates in the BEMR and actually used them as a challenge to move the close date to much more current years. In the case of Rocky Flats, they have used it as an opportunity to bring in the community, and their regulators. They are willing now to come forward with a date that will much reduce the closing date for Rocky Flats. That is being replicated at other sites.

I think what we need to now see is what commitments people can sign off to. This has with it a tremendous cultural challenge because now you have workers actually making a commitment to actually close down a site. But in the case of Rocky Flats, my recol-

lection is that they're talking about, in my view, early in the 21st century.

Mr. KNOLLENBERG. In BEMR they were talking about 20—and I'm not sure about this—20 or 30 years, but now they have shortened that.

Secretary O'LEARY. Exactly, but this has come from the challenge of the employees working it themselves. Now is everybody on board? Not yet. This will take time, but I think this process will permit us to very vigorously review these dates and bring them back to some order.

I leave you, though, with a caution only for your consideration. That is, to accomplish these goals, we will likely have to make larger investments in the short term to realize what we need. I know that it has often been said to you before as well that if the mortgage extends on and on, the payment for same gets to be very long. But there is a vigorous effort at Rocky Flats and other of our sites to make those dates much sooner than the BEMR which has accomplished its purpose. It was, in fact, a benchmark to get people to think about.

Mr. KNOLLENBERG. We're a little gun-shy here when somebody asks for more money to do something in a shorter timeframe. As you know, administrations do change. It's been pointed out that sometimes, if the procedure isn't done just right, they may be back asking for more money another decade or so down the road.

Secretary O'LEARY. I didn't want to leave the impression that I was asking for more money; I am not here, sir—I am comfortable with the budget put forward at $5.9 billion. I'm very proud of it.

Mr. KNOLLENBERG. Let me explain precisely what I mean by that in terms of Rocky Flats, in particular. I think it's Kaiser-Hill, isn't it, that has made a proposal in terms of shortening that timeframe?

Secretary O'LEARY. Yes.

ACCELERATED CLEANUP SCHEDULE

Mr. KNOLLENBERG. My understanding is that there is some consideration for additional monies that would be required to make that happen in a shorter timeframe.

Secretary O'LEARY. I'm understanding that. That's the point I was making to you, but I'm also telling you that we're not far enough along in the process to be able to deliberate on what to say to you definitively as to what we require. I didn't want you left with the impression that we would be requesting more money in this fiscal year. I am comfortable with the budget. But I understand the implication of what's being asked.

Mr. KNOLLENBERG. I'm talking far-range and, of course, this does not apply to the particular question. In other words, what do you see at Rocky Flats, and we're talking about Rocky Flats, what is the main obstacle in bringing it to closure within, say, 10 years, within a decade? Is there a main obstacle?

Secretary O'LEARY. Of course there are major obstacles. They, first of all, involve the money to be expended to get the work done, and the technology to get the work done. At some point in time we have to build structures, which is the case with the plutonium storage facility now. So this requires a review of all the work planned

with a hard look at doing what's done in every business: how do you shorten the timelines? How do you take out steps and at the same time maintain safety? It also requires that some of the transuranic waste now stored at the site actually gets moved out, which means that WIPP has to open on the date we have indicated. In my formal testimony I indicated that we will meet that date and likely we can beat that date, but any number of things are required. It is also very important to continue to work to look at how each one of these timetables can be shortened.

NUCLEAR WASTES

Mr. KNOLLENBERG. Well, in terms of the whole matter of nuclear waste, it is a concern. And you spoke about Russia, for example, and I'm sure you're not totally confident about the situation in Russia, I don't think; I don't think you could be. I don't think any of us got that impression when we travelled there, either. And in terms of the situation in Russia, they have a hard time getting an inventory on their product over there. We don't have that same problem here, I hope; I think we're on top of it pretty well.

Secretary O'LEARY. We don't have that problem here, sir.

Mr. KNOLLENBERG. Right. And that's comforting and we want to keep it that way, obviously, or we won't get to the point of being secure.

Just a quick question in regard to Russia: having travelled there, as you mentioned, four times, what is your feeling about the current status of their getting a grip on their nuclear problem? The feeling that some of us got when we were there is that they're ages away from us in terms of being on top of it and that what problems there might be in Russia may confront all of us in the future. So what is your current opinion of the situation and status in Russia?

RUSSIAN NUCLEAR CONCERNS

Secretary O'LEARY. My opinion is that everyone who worries about this threat, which some call the new nuclear danger, quite obviously should be concerned about it. Beyond concern about it, we move very aggressively to work with the Russians to try and achieve the standard that we have achieved in the United States, which has come at a very high cost. The Department of Energy has responsibility, as I indicated earlier, for only the civilian facilities, the facilities about which I think we ought to have the greatest concern because there has never been the military discipline, nor the distance of the closed cities, which is the case with the military fissile material.

I think we have done a dramatic job in less than two years, and I indicated what the statistics were from 70 kilograms to tons, and about to be hundreds of tons. It went very slowly in the beginning because we had to build trust. The Russians themselves have some technology which is very valuable; we have the edge on this technology. We're doing this lab-to-lab, which is not a bad idea because we avoid the infrastructure of the large bureaucracy which is the Ministry of Atomic Energy, which is not a bad idea in Russia.

We have another maybe 10 sites to begin work on. We completed one site in Latvia this year. We've just added 16 sites, so this is aggressive work with very sophisticated technology for portal pro-

tection, for detecting the movement of the inventory, and most especially for the sophisticated requirements of inventorying by computer. We also, this year, established at one site, with more to follow, very sophisticated onsite monitoring exchange between our Idaho laboratory in Idaho and the Kurchotov Institute in Moscow. This is where we're doing real-time surveillance with computers and other equipment. So we're making progress. Now, do we need to continue to work at this pace? Absolutely.

Mr. KNOLLENBERG. I appreciate that. My time is coming to an end, but I just wanted to thank you again for appearing here. I appreciate your straightforwardness in terms of some of the information that we would like to get in the future. I admire your spunk and spirit.

Secretary O'LEARY. Thank you, sir.

Mr. KNOLLENBERG. And thank you very kindly for testifying.

Mr. Chairman?

Mr. MYERS. Mr. Bevill?

Mr. BEVILL. Well, Mr. Chairman, I have several more questions here that I'm going to submit for the record to be answered on the record. You know I was just thinking that on Sunday at church I don't ever hear anything the preacher says after 12:00. [Laughter.]

Mr. MYERS. Did your Momma tell you never to make a speech after 7:00 in the evening, too? [Laughter.]

Mr. BEVILL. So I'm going to just submit those for the record.

Mr. KNOLLENBERG. Mr. Chairman, if I might, I do have some questions for the record which I would ask unanimous consent to submit as well.

Mr. MYERS. All members' questions, and we also have a request from Mr. Bilbray, a member of the Commerce Committee, who has a series of questions which we'll also provide for the record.

Secretary O'LEARY. Thank you.

Mr. MYERS. Thank you.

Well, Mr. Frelinghuysen, are you going to be as generous with your time?

Mr. FRELINGHUYSEN. I have a few questions. I also see, as I'm sitting here, Mr. Chairman, that Mr. Riggs has a number of questions. I'm not sure whether the staff has indicated, or whether you indicated that they might be put into the record.

Mr. MYERS. They'll be put into the record.

Mr. FRELINGHUYSEN. I just want to get back to the overall budget picture. In your 1997 budget submission you talk about continuing your commitment to deliver on the $14.1 billion in savings over five years; I'd like to know where we stand on that overall commitment. From what I can gather, last year the savings in fiscal year 1996 was $200 million. What do we anticipate it will be in fiscal year 1997?

STRATEGIC ALIGNMENT SAVINGS

Secretary O'LEARY. In fiscal year 1997 we will continue to meet our commitment—somebody's going to have to hand me the exact number which now leaves my memory. I will tell you, though, the thing that you perhaps need to hear more than what I can do, I will tell you what is my problem. My problems are the assumption that the Power Marketing Administrations would be offered for

sale. So we have a shortfall depending upon how one scores those. I'm not certain how I'm going to meet that shortfall. It will not be my problem to manage alone. It will be a problem for me to manage with the Office of Management and Budget. Other than that, I expect to be on track. But the one thing we were scoring that does not present itself as an obvious opportunity any longer is the sale of the Power Marketing Administrations, save for Alaska which is already counted on.

Other than that, we remain on target in the areas that I've described—and probably you don't want to hear me describe again—those that I have always talked about. It's, first of all, the sale of resources, one of which is Elk Hills, which the Congress did pass to give us permission to begin. It has cut down on our expenditures in our laboratory line and all of the other lines that I have indicated. The sum of what I presented to you with strategic alignment was just a bare piece of it, but we are there and I hope——

POWER MARKETING ADMINISTRATIONS

Mr. FRELINGHUYSEN. So I understand, in the event that nothing occurs relative to our power marketing authorities, you're going to recast your overall commitment?

Secretary O'LEARY. The administration will have to recast its overall commitment, of which I believe the Department of Energy will be a large supplier, but that is a piece yet to be done because we've just come to the conclusion, as has the Congress, that the Power Marketing Administrations are not offered for sale.

I will say this, and I will say it not by way of a threat or to indicate at all that this would be a plan, but it's clear to me, as we move forward to look at issues for restructuring the retail electric market, there is no way you can deal with that issue without dealing with the Power Marketing Administrations and other public power. So I suspect those issues will be on the table within the next two years at any rate because already legislation has been introduced to accomplish those goals.

SUPPORT SERVICE CONTRACTORS

Mr. FRELINGHUYSEN. The Department of Energy, from my reading of the budget, takes credit for $120 million in savings from support service contracts.

Secretary O'LEARY. Yes, sir.

Mr. FRELINGHUYSEN. However, I understand that it was actually Congress that directed you to reduce your support service contracts in the fiscal year 1996 Energy and Water Appropriations Act. You're taking credit for those reductions when, in fact, I assume by all counts you're basically complying with the law.

Secretary O'LEARY. Not at all, sir. I was ahead of the curve on that issue and we were already working it, thank you.

FEDERAL ENERGY REGULATORY COMMISSION

Mr. FRELINGHUYSEN. All right, one interpretation. One proposal in the Strategic Alignment was separating FERC. Where do we stand relative to separating FERC?

Secretary O'LEARY. Our administration has submitted legislation; we await the action of the Congress.

Mr. FRELINGHUYSEN. So you support that proposal.

Secretary O'LEARY. On October 23, 1995, we submitted the legislation.

SCIENCE-BASED STOCKPILE STEWARDSHIP

Mr. FRELINGHUYSEN. All right. Relative to nuclear weapons I see from the Department's budget request the President's decision to cease nuclear testing entails $160 million in costs in fiscal year 1997 alone. What is the total cost of developing and operating science-based alternatives to nuclear testing?

Secretary O'LEARY. There is a figure contained in the outyear budget which is now subject to revision occasioned by the President's decision last week outlining how we shall accomplish those goals. So I will have to now spend—and this just happened on the 18th—we'll have to spend some time with our colleagues at the Defense Department and the National Security Council, generally, to rework those costs which I would hope will be available to this committee well before the time you begin to deliberate not only this year's budget, but the outyear budget, where I think the costs need to be given to you.

FUSION

Mr. FRELINGHUYSEN. Relative to fusion energy, the Fusion Energy Advisory Committee has recommended to your Department a restructured fusion program, and I'm sure you're aware of that. Can you describe briefly the process and timing of the review and how you generally view their recommendations?

Secretary O'LEARY. Well, the review was undertaken last year as soon as we began to understand the will of the public and the Congress on our investment in fusion energy. There was an advisory committee which reported directly to Dr. Krebs. Their recommendation was formalized, my recollection is, under two months ago. I have had, as has my Deputy and all the other people who need to, not only in my office but, the chief science advisor to the President, and I have had the benefit of review of the leadership of that task force. Our budget reflects their guidance, and I hope that you will consider that strongly when you review that portion of our budget.

Mr. FRELINGHUYSEN. Well, I feel strongly about that portion of your budget and certainly that program, as do other members of the committee. I understand that your original budget submission relative to this program was approximately $200 million, and, in fact, the Fusion Energy Advisory Committee recommended a higher figure. I was wondering if, in fact, that was the case. Was your original submission to OMB $200 million?

Secretary O'LEARY. I don't recall the detail. I remember we were at $200 million and then we were at $250 million—Martha Krebs is here, she knows. She says, yes, that's correct—and then we were at $250 million and then we——

Mr. FRELINGHUYSEN. So it's been kicked up?

Secretary O'LEARY. Yes, exactly. The advisory committee served as an excellent advisor to the Department and to the administration, and we are grateful.

ENVIRONMENTAL MANAGEMENT

Mr. FRELINGHUYSEN. Relative to environmental management, the administration projects savings of $630 million from privatizing low-level, mixed-waste treatment and laundry services at Hanford. Can you tell me what the basis for this estimate is?

Secretary O'LEARY. I cannot. I would have to provide that for the record. I'm not engaged at that level of detail; I can be and I will review this work before I send it to you.

Mr. FRELINGHUYSEN. It's quite a lot of money.

Secretary O'LEARY. I understand.

[The information follows:]

The estimated savings for the low-level waste treatment is $570 million and the laundry is $40 million over 10 years. The basis for each is as follows:

Low-Level Waste Treatment

An engineering study and cost estimate for a stand-alone facility to process the mixed low-level waste was the original basis for the estimate. The facility cost was estimated at $410 million and $200 million in operating costs over twenty years for a total of $610 million, excluding the contingency for facility construction of $210 million. These estimates were based on a cost-plus contract method.

Subsequently, a privatized contractor was awarded, via a competitive bid process, a fixed-price contract for $24 million to process and treat about 90 percent of the low-level mixed waste. Working back from the $610 million (facility cost at $410 million and operating costs at $200 million), we get something close to a $590 million savings, but this only addresses 90 percent of the waste. The other 10 percent of the mixed waste requires remote handling and may be either processed at another Hanford facility or possibly characterized, packed and shipped to WIPP. Cost estimates are not available for this waste. Thus, the savings estimate of approximately $570 million involves considerable uncertainty and includes attempts to take into account the cost estimates available, the different types of contracting (fixed-price vs. cost-plus), and other factors.

Laundry

The Hanford laundry was privatized in August 1993. Projected savings were estimated at $60 million over a ten year period (5 year contract with five one-year option periods) based on a total M&O estimate of $100 million vs. $40 million by the private sector.

The basis for these cost savings were the following:

1. A cost avoidance by not having to build a new laundry on site which was in design approximately $24 million.

2. A cost differential of $2.33 dollars per pound of laundry based on existing site cost of $4.03 vs. private costs of $1.70 per pound. With a projected volume of approximately 1.5 million pounds per year, estimated savings over a ten year period equals approximately $35 million.

PRIVATIZING WASTE CLEANUP

Mr. FRELINGHUYSEN. What exactly is meant—I know we use these terms in all levels of government a lot—by the term "privatizing cleanup"? It was always my understanding that DOE employees were not actually doing the cleanup, that the work, historically, had always been done by private contractors. If private firms continue to do the cleanup work, what, in fact, do we mean by privatization? Is this a new level of privatization?

Secretary O'LEARY. I think it's a new approach to privatization which basically adopts the concept that the Government does not pay anything until it gets return, which means the product. In the case of privatizing the waste operation for the tanks of Hanford, it would mean that the private firm takes the risk to produce the technology and to produce the plant and the factory to do the work and their payoff comes when they are producing product, which is processed waste. It's a very different concept. Although we have tied ourselves to believing that these contract employees, in fact, are very different from Federal employees, it would be very hard to tell, either in engaging with them or in their capabilities and even the badges that they wear, which is currently the case. It's very hard for me to see the difference between a Federal employee and a contract employee.

Mr. FRELINGHUYSEN. With respect to the defense environmental restoration and waste management budget, your budget request indicates that the environmental restoration request represents the highest percentage of the program's budget, although funding declines from $1.8 billion to $1.76 billion. I see that virtually all programs would be reduced except for technology development—that's 2 percent—and policy management, 85 percent. Could you please explain the sharp increase for policy and management?

ENVIRONMENTAL MANAGEMENT INCREASES

Secretary O'LEARY. Well, I think I addressed it earlier when I talked about the fact that we had—and I believe it was very good advice—when asked to clearly reveal in our budget all of the facts for the cost of employees and the support of the employees. That represents a piece of it. Training and education, which is most important in this work of cleanup, is a part of that. I see here what they're calling "stakeholder affairs," Mr. Chapman, that we've used that term again, which really has to deal with the people living near our community. I think I've pretty much covered it in summary and in total. In the technology area it is, of course, the work to use technology to advance the cleanup, which I discussed in the exchange with Mr. Knollenberg.

UNIVERSITY OF CALIFORNIA PENSION PLAN

Mr. FRELINGHUYSEN. One other question and then this will be it, thank you. I understand that the University of California manages the DOE facilities at Los Alamos and Livermore?

Secretary O'LEARY. That's correct.

Mr. FRELINGHUYSEN. To what extent do we as taxpayers contribute to the pension system for the University of California relative to those employees? I understand that the pension system is over-

funded, and I just wondered to what extent it was and to what extent we, in fact, are participating in that.

Secretary O'LEARY. Well, we, in our contract arrangements with the University of California for those employees who are part of the pension system of the University of California, we do, take care in our salary account, of those payments which are necessary to continue the pension fund. I have now for two years been very deeply engaged in these issues involving the over-subscription to the pension fund and have also been working with the University of California to try and attempt to come up with some appropriate methodology to permit the Federal Government to back off of its current payment schedule, taking into consideration the fact that the fund is now over-subscribed.

I suspect a time when we can do this is just right now as we begin to negotiate on the extension of the contract between the University of California and the Department of Energy. I'm very grateful that you have raised this issue. I hope that many people will be watching and will know of this dialog because I'm very serious about getting this item taken care of.

Mr. FRELINGHUYSEN. Thank you for shedding some light on it and thank you for your responses.

Thank you, Mr. Chairman.

Mr. MYERS. Mr. Chapman?

Mr. CHAPMAN. Mr. Chairman, with your permission, I have some additional questions I'd like to submit for the record, but I'm exactly like Mr. Bevill and tune out about noon, too. I really haven't tuned out; I've been listening, but in order to expedite the hearing, all of the questions I have can be submitted for the record. And, with your permission, I'll do so.

Mr. MYERS. This last round I hope we can restrict our time—some have already volunteered to do that—to 10 minutes. But I have two or three more questions. We all have a lot of questions that we can provide for you.

Secretary O'LEARY. Yes, sir.

TERMINATED PROGRAMS

Mr. MYERS. Seeing that it's Easter, maybe by the 4th of July you can get them all completed, all the questions we're going to have.

Last year this subcommittee didn't fund all your requests and we also zeroed out a number of programs which we felt—and we try not to micro-mange—but we felt were not getting the return for the taxpayer. You know we have to deal with benefit-cost ratios all the time here and in other programs, so we zeroed them out.

But now we find that, as an example, the Russian power replacement that we zeroed out was not zeroed out, even though the conference went along with most of these that became law. But we understand that the Russian power replacement has been financed, along with several other agencies and programs we terminated, have not been terminated. It is our intention by this subcommittee—I don't think there's any question about that—that they be terminated, but we find that they weren't.

Secretary O'LEARY. Well, Mr. Chairman, as I understand the rules of the game, the instruction had to do with the fiscal year 1996 budget; it did not have to do with the various activities that

the Department might choose to undertake either in collaboration with other agencies or using prior year balances. The work with respect to the closedown of the weapons, the fissile material production reactors, three reactors in the Soviet Union in Tomsk and Krasnoyarsk, have been a very important agenda item to our President, our Vice President, and specifically to this Secretary of Energy. I do not see the need nor the requirement to continue the production of this material which can be used for the very fissile material that we now discuss controlling. We have gone forward with that work.

I have hoped, and had hoped, that you would see we were being diligent in your direction with respect to the money that was used. I want to assure you that in this regard I take the direction of the President of the United States with respect to my activities. I believe that this is work that requires doing and I have tried to take your direction with respect to where those funds shall come from.

But I believe that this is very serious and important work, and, more importantly, I am clear that within the next—nuclear summit some decision will be made on the ultimate shutdown of those reactors and the replacement power, which is very important to the world in terms of non-proliferation and is exceedingly important to the world and most of Western Europe in terms of nuclear safety. Those are not the most reliable reactors. I have tried to follow the dictates with everyone with whom I have a working relationship and I want to point out that it hasn't been easy.

Mr. MYERS. You have a difficult job, I realize, but I think you stipulated that it has, but where did the money come from?

Secretary O'LEARY. The money came from prior year balances and I'm afraid I'm going to have——

Mr. MYERS. In that category, though?

Secretary O'LEARY. And money from the State Department as well. Yes, sir. We have not disobeyed the direction of this committee.

Mr. MYERS. Would you provide for the record the exact amount of how much money——

Secretary O'LEARY. I would be delighted to.

Mr. MYERS [continuing]. And how many people are involved in these programs that are continuing, even though the intention of Congress—both the Senate and the House—was to terminate some of these programs, right or wrong? We just felt like we have to reprioritize all of the time, as you have to.

Secretary O'LEARY. I understand.

[The information follows:]

RUSSIAN REPLACEMENT POWER INITIATIVE

In June 1995, the Gore-Chernomyrdin Commission agreed to examine the possibility of converting the fuel in Russia's three plutonium production reactors so that they continue to produce essential heat and electricity for the region while no longer producing weapons-grade plutonium. The Commission also agreed to study the option of replacing the production reactors with new nuclear power plants. The initial phase of feasibility studies for these options were completed in December 1995. Sources of funding for the studies were: $3 million in FY 1995 funds from Department of Energy accounts ($1 million from Non-proliferation and National Security, and $2 million from Nuclear Energy, $1 million of which was reprogrammed from excess prior year balances); and $1.2 million in FY 1996, from the U.S. Department of State's Nonproliferation and Disarmament funds. In January 1996 the Gore-

Chernomyrdin Commission agreed to continue with the design, testing, and analysis of the new fuel for core conversion Funding for this activity is being sought from sources outside the Department of Energy.

ISOTOPE PRODUCTION

Mr. MYERS. Okay, I have one last question. You know my concern about isotope production.

Secretary O'LEARY. I do, sir.

Mr. MYERS. From a personal experience, we talked a moment ago about production in this country. It's shocking that almost all of the isotopes required in medication today, especially in diagnostic work, are produced outside of the United States, a lot of it in Canada, but a lot of it comes out of even Russia today. I understand you had a solicitation for the private production of isotopes; it was due today, I think, or I've heard this. What can you tell us about your intention here?

Secretary O'LEARY. I can tell you that my intention is the same as yours. That is that the Department undertake this critical activity to produce isotopes, which are short-lived and very necessary in the United States for the diagnostic treatment and for curing victims of cancer. I intend to act on the response to those solicitations. The people in Dr. Krebs's area have some clear ideas about where the most cost-effective production can take place. You can well understand that our own laboratories will be bidding for the responsibility, but I have a personal commitment to get this work done, for reasons that I think you understand, but, more importantly, in the time that I have been in this job I've met and touched many people who impress upon me, as you have, the need to create this. This is not a luxury. This is a necessity within the United States.

Mr. MYERS. How soon can we expect a decision on this? Martha, or whoever is going to answer that?

Secretary O'LEARY. Next month, yes.

Mr. MYERS. Without delving into this, have you seen so far any interest in it?

Secretary O'LEARY. Yes.

Mr. MYERS. Well, good. There will be some competition you think? Okay.

Mr. Knollenberg?

Mr. KNOLLENBERG. No questions, Mr. Chairman.

Mr. MYERS. Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. No, I'll submit mine for the record.

Mr. MYERS. You've been here almost three hours and you've been very patient, and your supporting cast, and you in the audience. We're sorry about the votes we had to interrupt, and we thank you for changing the schedule. We had difficulty last week, last Tuesday, so we appreciate your willingness to come today and your candor, even though we may disagree.

Secretary O'LEARY. I understand, and we do have candor with one another and deep respect, deep respect.

Mr. MYERS. Well, yesterday we had the naval nuclear reactors; we used to have Admiral Rickover, the old salt himself, and we'd go round and round, but that's kind of healthy.

Secretary O'LEARY. Yes, it is.

Mr. MYERS. Sure, nothing wrong with that. And you said I beat you up——

Secretary O'LEARY. Oh, you did.

Mr. MYERS. Let the record show there's no bruises today and no blood on the floor. [Laughter.]

Secretary O'LEARY. That's because I had my golf club. [Laughter.]

Mr. MYERS. You know she fired a shot across my bow, you know. Okay, big guy. Well, thank you very much.

Secretary O'LEARY. Thank you, Mr. Chairman.

Mr. MYERS. And even though three of us will not be here next year to harangue——

Secretary O'LEARY. I will miss you.

Mr. MYERS [continuing]. There will be somebody here to pick it up, I'm sure. Well, thank you very much for your testimony.

Secretary O'LEARY. Thank you, sir.

Mr. MYERS. The committee will stand adjourned and subject to the call of the House.

[The statement of Secretary O'Leary and questions and answers submitted for the record follow:]

Statement of Hazel R. O'Leary
Secretary
U.S. Department of Energy
FY 1997 Appropriations Hearing

Mr. Chairman and Members of the Committee, I appreciate this opportunity to present the Clinton Administration's FY 1997 budget request for the Department of Energy.

We have taken a Department that was shaped by the Cold War and turned it into a leaner agency helping the nation meet tomorrow's challenges by ensuring a secure national defense, providing for a more sustainable energy future, advancing science and technology and improving environmental quality.

The budget that we are presenting for FY 1997 will deliver results that matter to the American public, from hundreds of tons of nuclear weapons materials safeguarded and hundreds of contaminated sites cleaned up, to increase oil production through new technologies and breakthroughs in our understanding of the fundamental building blocks of matter. And we will deliver these results with a contractor staff reduced by more than 30,000 employees, a 20 percent decrease since 1993. Similarly the Department is reducing its federal employees. Since 1993, the federal workforce has declined by over 1,000 employees, a six percent decrease, and by FY 2000 we will reduce the federal staff by 27 percent.

With this budget we will maintain the safety and reliability of the nation's nuclear stockpile through our science-based stockpile stewardship program, dismantle weapons safely, assure an adequate supply of tritium and invest in new tools such as the Accelerated Strategic Computing Initiative and the National Ignition Facility to maintain the confidence in the safety, security and reliability of the stockpile in the absence of underground testing.

We will continue to make major advances in renewable energy, energy efficiency, fossil and nuclear technologies--which will be vital for our energy security needs into the next century. We will expand cost-shared partnerships with industry to increase use of solar and renewable technologies in domestic and international markets, creating jobs for U.S. Industry. We will continue to work with the nuclear industry to obtain certification of advanced, standardized light water reactor plants that can serve our energy needs in the next century, and we will focus on energy technologies which can deliver clean, efficient power to consumers.

We will preserve a crucial level of funding for fundamental science programs and are bringing capital investments on line. In Nuclear Physics, the Continuous Electron Beam Accelerator Facility (CEBAF) in Norfolk, Virginia, is now operational, and the construction of the Relativistic Heavy Ion Collider (RHIC) remains at expected cost and on schedule. In High Energy Physics, the Department expects the completion of the B-Factory at the Stanford Linear Accelerator Center in FY 1998 and the Main Injector project at Fermilab in FY 1999. In Basic Energy Sciences the 6-7 GeV synchrotron Radiation Source at Argonne will be completed this year.

We will continue to make substantial progress in our environmental management program to reduce the risks and to cleanup the legacy of the Cold War at our former nuclear weapons production facilities. Out of an original 705 sites, 194 large-scale contaminated sites have been cleaned up. Our percent of actual cleanup versus studies and overhead has gone from 35 percent in FY 1993 to 67 percent in FY 1997 because we are managing better.

As we approach a new millennium, it is important for us to focus carefully on our two obligations to future generations: (1) to make the necessary investments today that will enhance the security and prosperity of our nation 10, 20, and 50 years from now, and (2) to contain federal spending so as to reduce the federal deficit and balance the budget. Striking an appropriate balance between these competing imperatives is a major challenge facing our government today. Within the Department's FY 1997 budget, we believe that we have met this challenge by cutting unnecessary expenditures while advancing programs that will offer significant returns to the public well into the future.

We are presenting the budget in terms of the investments we will make and the public benefits we will deliver.

AGGRESSIVE MANAGEMENT REFORMS

In January 1993, the previous Administration submitted a budget to Congress projecting that the Department's FY 1997 budget would be $21.5 billion. In contrast, the Clinton Administration is requesting $16.3 billion for FY 1997--a reduction of more that $5 billion. Our FY 1997 budget is the Department's lowest submitted request since 1990 and is $3 billion below our FY 1993 enacted level of $19.3 billion.

In January 1993, the Department of Energy employed 148,000 contractors at its laboratories, weapons production sites, and waste cleanup facilities located in 35 states. Today our contractor workforce numbers 117,000--a 20 percent reduction.

Using workforce management tools such as buyouts, attrition, outplacement, managed hiring and involuntary separations, we have eliminated 1,300 federal staff positions toward our FY 1996 target reduction of 1,380. Our goal is a 27 percent reduction over five years.

The Department has instituted an openness initiative with the goal of rolling back decades of secrecy and replacing it with earned trust and public engagement. In January 1993, the Department held more than 32 million pages of classified documents and had no plan to systematically declassify information that no longer needed to be kept from the public. Since then, we have released more than two million pages of formerly classified information, implemented a ground breaking openness policy, and initiated a declassification review of all remaining classified documents.

In May 1995, we announced a comprehensive Strategic Alignment Initiative (SAI) that is yielding

an estimated $1.7 billion in savings over five years through reductions in the Department's federal workforce, elimination of organizational redundancies, and major cuts in unnecessary overhead costs. Today, the Department is meeting or exceeding all of the major cost-saving targets that we set for ourselves last spring as part of the Strategic Alignment Initiative. We forecast FY 1996 savings of approximately $277 million--$55 million more than originally targeted within the following categories: a $120 million decrease to support service contracts; a $41 million decrease in information resource management; a $40 million reduction to travel; a $55 million reduction for staff savings; $15 million sold cold war assets and; $6 million saved in National Environmental Protection Act activities. Additionally, we have closed three field offices, vacated three Washington, D.C. office locations, and have consolidated several programs.

Other major initiatives will change the way we do business and save money for the American taxpayers. Contract reform has already saved approximately $1.1 billion, with $3-5 billion projected over the next 5 years. Through the recommendations of the Galvin Task Force review of the national laboratories and the Yergin Task Force review of our energy research and development portfolio, we expect over $2 billion in additional savings through improved management practices.

MAKING OUR REFORMS STICK

The President and Vice President worked hard to institutionalize management reforms and establish accountability. We are the first agency in the Federal Government to have a Performance Agreement signed by the President in FY 1996. In this year's agreement we have 67 commitments and 183 measures of success. This agreement explains in real measurable results, the benefits the Department will deliver to the American people.

The Department has taken seriously its requirement to establish a Performance Agreement with the President of the United States which establishes the strategic goals in each of our mission areas and spells out how our success should be measured. This new approach to Government management and accountability has enabled the Department to more clearly link our funding priorities to the Department's strategic goals and objectives and, at the same time, manage and understand the real benefits being delivered to the American people.

Our FY 1995 Performance Agreement with the President contained 59 commitments and 134 measures of success. By managing for results, I am able to tell you that we delivered on all of these commitments, in many cases exceeding our success measures. For example, we had committed to adding 1,000 voluntary businesses to support the President's Climate Change Action Plan. Last year over 1,600 partners volunteered for this plan which will now reduce carbon and related greenhouse gas emissions by four million metric tons.

This management system also gives visibility to areas in which we fell short. Last year I made a commitment to the President to add 25,000 alternative fuel vehicles to Federal and local fleets. This would have displaced 14 million gallons of gasoline. However, due to budget constraints,

we were only able to add 10,000 vehicles and an opportunity to displace gasoline usage and to strengthen an alternative fuel vehicle infrastructure was weakened.

Our Agreement is a public document. The American Taxpayers deserve to know what our commitments are and whether we are meeting them. Federal managers need to know how their performance will be measured. And you need to know how we are doing.

INVESTMENTS TO REDUCE THE NUCLEAR DANGER

In response to a rapidly changing global environment and as a result of this Administration's investments, the Department's national security programs are dramatically changed from four years ago.

We no longer test nuclear weapons underground. Instead, we have a science-based program underway to ensure a safe and reliable deterrent without testing. We have streamlined the nuclear weapons program to meet the nation's post-Cold War deterrent requirements. This means we have a strong nuclear deterrent with 4,318 fewer weapons in our stockpile than we did at the end of 1992.

The Department has expanded efforts to secure nuclear materials, technology, and expertise in Russia and the Newly Independent States. Before the end of 1996, we expect to broaden the Materials Protection, Control, and Accounting (MPC&A) program to over 35 facilities in Russia and the Newly Independent States and to protect hundreds of tons of fissile material. In addition, the Department is leading the U.S. effort to secure and store the spent nuclear fuel at the North Korean nuclear facility at Nyongbyon.

We are safely disposing of nuclear materials deemed surplus to our national defense needs, as well as surplus materials posing a proliferation threat from other countries. In 1995 alone the Department obtained 6.2 metric tons of highly enriched uranium from former Soviet weapons, enough to produce hundreds of weapons.

As we make these changes, we are working hard to minimize the adverse impacts on neighboring communities and on those who have served the Cold War weapons complex. Our Worker and Community Transition program has successfully managed the reduction of over 30,000 contractor personnel since the end of FY 1992. We continue to work hand-in-hand with communities, offering assistance to re-tool local economies and retrain workers to soften the impact of our changing national security mission.

The Department's national security programs, as presented in our FY 1997 budget requests, are aimed at helping deliver a more secure future in the following ways.

Defense Programs

The Department is requesting $3.7 billion in FY 1997 for Defense Programs, a slight increase over the current appropriation. This request reflects a year in which the program will continue to implement prior initiatives, as well as complete a comprehensive assessment of what must be done to ensure the strength of the U.S. nuclear weapons program for the next ten years.

For Stockpile Stewardship activities within Defense Programs, we request $1.576 billion, a five percent increase above the FY 1996 appropriation. This level continues the near-term investment in the new tools required to maintain confidence in the safety, security, and reliability of the stockpile in the absence of underground testing. The Stewardship activities proposed for FY 1997 include the Accelerated Strategic Computing Initiative (ASCI). An example of the progress we have made is a partnership we announced in September 1995, which is a $45 million joint development contract between the Department, Sandia National Laboratories and the Intel Corporation to build a computer ten times more powerful than any that exist today, by the end of 1996. ASCI will accelerate the development of computer simulation for nuclear weapons test, remanufacture, and surveillance. In addition, we will support three vendor partnerships for hardware and software support.

The National Ignition Facility continues with an FY 1997 request of $59.2 million in operating funds and $131.9 million for construction. This request reflects the shift to final detailed design and site specific activities for the world's largest and most powerful laser--a key experimental capability necessary for a science-based stockpile stewardship program.

The Stockpile Management program within Defense Programs, supports the maintenance, evaluation, dismantlement, transportation, and disposal of nuclear weapons in accordance with the quality, quantity, and schedule requirements approved by the President in the Nuclear Weapons Stockpile Plan. The program continues its historical responsibilities to address issues of near-term and long-range support for the enduring stockpile, and for ensuring an adequate supply of tritium. Along with routine stockpile surveillance, this includes corrective maintenance and system replacement, as well as weapon dismantlement.

For Stockpile Management, we request $1.798 billion, a net decrease of $45.2 million from the FY 1996 level. Included is a $25 million increase to support the dual-track strategy to provide a new assured source of tritium. The Department will investigate both the design and development of a linear accelerator as well as the purchase of an existing commercial Light Water Reactor or irradiation service, as the primary method of tritium production to supply the weapons stockpile.

Also included within Stockpile Management request of is a decrease of $81.6 million to complete the transfer of the non-nuclear programmatic roles located at the Mound, Pinellas, and Rocky Flats facilities to those located at Kansas City, Savannah River, Los Alamos and Sandia National Laboratories.

Nonproliferation and National Security

Reducing the danger posed by weapons of mass destruction is one of the Administration's primary national security goals. The Department is uniquely suited to provide leadership in efforts to reduce nuclear weapons world wide; secure and prevent the spread of nuclear materials, technology and expertise; roll back nuclear weapons development programs; avoid proliferation surprise; and respond to emergencies. The Department played a major role in the indefinite extension of the Nuclear Nonproliferation Treaty and now provides vital support to the U.S. Government's efforts to conclude negotiations, prepare for entry into force, and implement a Comprehensive Test Ban Treaty. The Department also leads the U.S. effort to limit the production and use of reactor-grade plutonium internationally.

The FY 1997 budget request of $587 million continues these activities and provides additional resources for urgently required nonproliferation activities in Russia and the Newly Independent States as well as the implementation of the President's Executive Order on Declassification.

For nonproliferation and verification research and development, the FY 1997 request of $194.9 million will maintain current R&D activities to develop the technology and tools for detecting and characterizing proliferant activities as well as treaty agreement monitoring and verification. Also included is the development of the technologies and systems (hydroacoustic, radio-nuclide, seismic, and infrasound) to support monitoring of the Comprehensive Test Ban.

The Arms Control FY 1997 budget request of $181.2 million reflects efforts in the areas of nuclear materials protection control and accounting within Russia and the Newly Independent States. This request also sustains activities such as: support to long-term monitoring of Iraqi facilities and other programs of the International Atomic Energy Agency; negotiation and implementation of agreements to secure surplus fissile materials; critical operations in cooperation with the Democratic People's Republic of Korea to stabilize and safely store spent nuclear fuel; analytical and technical support for various international treaties, agreements and negotiations; and implementation of international inspection agreements.

Fissile Materials Disposition

One of the key challenges arising from the end of the Cold War is the need for safe, secure, and environmentally sound management of weapons-useable fissile materials both in the United States and the former Soviet Union. Significant quantities of these materials, including plutonium and highly enriched uranium, are now no longer needed for defense purposes. Further agreements on disarmament between the two nations may increase the surplus quantities of these materials. Global stockpiles of weapons usable fissile materials pose a danger to national and international security if they are not properly managed and disposed of in a manner that effectively precludes their reuse in nuclear weapons.

The Department's Fissile Materials Disposition Program directs research and development and technical demonstrations of plutonium disposition technologies and the design phase for site-specific long-term storage configurations involving a coordinated approach to the Department's

inventory of weapons-usable fissile materials. Program efforts also include technical and industrial activities associated with the conversion of surplus weapons-usable highly enriched uranium to non-weapons useable low enriched uranium suitable for use in commercial power reactors. Through the Fissile Materials Disposition Program, the Department and its national laboratories are providing the technical expertise in support of a joint study with Russia on technical options for the disposition of weapons-usable plutonium. The efforts of this program directly contribute to advancing U.S. and global nonproliferation interests involving Russia and other nations and to improving the cost-effectiveness of the Department's management of stockpiles of surplus fissile materials.

The FY 1997 request for Fissile Materials Disposition is $93.8 million, an increase of $23.5 million over the current level. The FY 1997 program will continue tests to validate disposition technology options under consideration, complete the Advanced Recovery and Integrated Extraction System (ARIES) to disassemble nuclear weapon pits and convert plutonium to unclassified forms, initiate conceptual design of a full-scale plutonium pit disassembly, and dispose of surplus uranium materials. The increase provides for Title I design of consolidated storage facility options from which a final decision will be made.

International Nuclear Safety and Security

The FY 1997 request within the appropriation for Other Defense Activities is $72.2 million, which appears to be a dramatic increase over the current appropriation. In fact, the FY 1996 appropriation is supported by prior year balances transferred from the Agency for International Development late in FY 1995. Funding from outside resources will not be available in FY 1997. This request continues the Department's cooperative efforts to improve the physical condition and safety infrastructure in countries operating Soviet-designed reactors and reduce the safety and nonproliferation danger from other types of nuclear facilities. Among its key accomplishments, the program has established training centers in Russia and Ukraine that have trained more than 250 nuclear plant personnel; helped develop more than 100 emergency operating instructions for three different types of plants; supplied safety equipment and technology at five of the oldest, least safe nuclear power plants; and transferred manufacturing technology and safety analysis capabilities to the host countries.

The Department also deals with many matters in which nonproliferation and nuclear safety capabilities are being combined to support important national security goals, such as the effort to assist Russia in eliminating production of weapons-grade plutonium at its three remaining plutonium production reactors at Tomsk and Krasnoyarsk. We are also working to ensure transparency in the blending down of Russian uranium from dismantled weapons for purchase by the U.S. Enrichment Corporation. Continued cooperation is needed for permanent improvements in safety attitude and culture to take hold, and our FY 1997 budget request reflects this need.

In FY 1997, this program will invest in additional training courses and improvements at Soviet-designed nuclear power plants; help establish international nuclear safety co-centers in Russia and Ukraine; support the efforts to shut down the Chernobyl nuclear power plant through programs in

decommissioning and replacing the sarcophagus over destroyed unit 4; continue efforts to stop the production of weapons-grade plutonium in Russia; and conduct complementary programs of safety and materials protection, control, and accounting at other nuclear facilities, such as breeder reactors and spent fuel management facilities.

Naval Reactors The FY 1997 request for the Naval Reactor program is $663.9 million to continue efforts to support the U.S. fleet with over 120 operating naval reactors in operating submarines and surface ships and continued development of the New Attack Submarine class. The Program's cost-saving initiatives include shutting down six of eight land-based test, research and development prototype plants by the end of FY 1996.

Worker and Community Transition
The FY 1997 budget request for Worker and Community Transition activities is $67 million, which is $14.7 million less than in FY 1996. Funding in FY 1997 will provide for greater emphasis on assistance for local economic development authorities, promote rapid and effective defense conversion with new private sector jobs for displaced workers and new businesses for the communities. Despite the achievement of significant personnel reductions, program workload is expected to remain high as the Department faces anticipated budget constraints.

INVESTMENTS TO ENHANCE ENERGY SECURITY

The nation wants a future in which energy supplies meet our economic goals without threatening our national security due to dependence on imported oil and without causing harm to the environment. Our energy resource research and development programs are meeting this challenge.

The Office of Energy Efficiency and Renewable Energy (EE) is requesting a total of $1.084 billion. These funds support a request of $369 million in the Energy Supply R&D Appropriation for Solar and Renewable Energy and a request of $715 million for Energy Conservation which is funded under the Interior and Related Agencies Appropriations.

Solar and Renewable Energy
The Department's Solar and Renewable Resource Technologies programs have made the U.S. the world leader in research and development for these advanced technologies. Major advances in photovoltaic power arrays, wind and solar thermal power generation, and biomass energy conversion systems, are the products of focused, strategic investments by the Department.

Our investments promise significant returns, measured by the contribution of renewable energy resources to the world's energy supply at competitive prices. Our Department's path-breaking research and development has put renewable energy technologies on a price and performance path which, if continued, will drive the cost of these technologies to competitive levels within 20 years and, in some cases, within five years. With increased market share for renewable technologies comes cleaner air and high-quality U.S. jobs in what could be a $50 billion world-wide market.

Our research and development programs must continually show definitive progress toward this longer return. For each year's investment, we expect to see significant technological progress. Those technologies that cannot deliver are dropped from our portfolio. The number of technologies included in our research portfolio has been reduced by three times since the 1980's.

Since 1993, the Department has invested $835 million in solar and other renewable energy technologies. From that investment, we have already realized some significant returns. Our researchers have set several world records in photovoltaic cell efficiency. Each one percent increase in cell efficiency produces an almost ten percent increase in electric power production efficiency. The cost of electricity from photovoltaics has dropped by almost ten cents per kilowatt-hour since the early 1990's. We have increased the efficiency of solar heating for buildings from 30 to 70 percent, decreasing costs by a factor of five. The Solar Two project, an advanced solar power tower for large-scale electricity production, is now virtually complete and ready for dedication in June 1996.

We are conducting two innovative biomass power projects in Hawaii and Vermont, and helped develop new hybrid energy crops, bred to grow quickly in different regions of the country for use as bioenergy feedstocks.

Our Wind energy program has funded technology developments that have pushed the cost of wind power down to four cents per kilowatt hour, close to the competitive range. Buyers have already signed $300 million in purchase orders for new state-of-the-art wind turbine prototypes developed in 1994 and 1995.

High-temperature superconductivity -- the ability to move electrical current through a wire with virtually no energy loss -- is moving rapidly from the laboratory bench to the commercial world as a direct result of DOE-sponsored research. Our program has achieved world record performance.

The FY 1997 request for Solar and Renewable Energy programs is $369 million, which restores the program to its FY 1995 funding level. This request funds a balanced portfolio of research and development in the near, mid, and long-term renewable technologies. The program's technology deployment activities are heavily cost-shared by industry.

The request includes: a Photovoltaics program at $87 million to continue research in manufacturing processes, commercial and residential applications, and validating utility applications of technology; a Solar Thermal program at $24 million to continue research and development in three technology areas: power towers, dish/engines, and parabolic troughs. The program is working to reduce the cost of solar generated electricity from 17 cents/kWh to 5-7 cents/kWh; a Biofuels program at $81 million to develop cost-competitive technologies to convert biomass into electric power production and liquid transportation fuels; a Wind program at $50 million to continue research to enhance the cost-effectiveness of wind turbine systems to generate electricity; a Geothermal program at $35.6 million to continue research that reduces exploration and drilling costs; locates and confirms undiscovered geothermal sources; and enhances the

efficiency of converting geothermal power to electricity; and Electric Energy Systems and Storage program at $36 million to continue research in the area of electric magnetic fields, high-temperature superconductivity, and electric utility system efficiency.

Nuclear Energy

The Department's nuclear energy research and development program has changed significantly over the last three years. Where the Department once attempted to develop several technologies for eventual commercialization, our program is now focused on a single technology, light water reactors. Instead of expending millions of dollars on more exotic technologies that had limited appeal to the private sector, the Department is working in cooperation with industry to build on three decades of successful and safe light water reactor operations. We are developing new technologies and designing advanced, standardized plants that can serve this country's energy needs in the next century.

In FY 1997, the Department proposes to allocate $40 million to its light water reactor program. This year's funding will enable the Department to obtain Nuclear Regulatory Commission design certifications for two large "evolutionary" nuclear power plants by the end of the calendar year, and continue the important design engineering work on simplified, passively-safe nuclear power plants. These designs represent the best, safest, and most-cost-effective nuclear energy technology in the world.

As our advanced light water reactor program moves toward a successful conclusion, the Department will focus more of its attention on the technical issues affecting the long-term operation of our current nuclear power plants. For example, part of the Department's FY 1997 request will be used to demonstrate advanced technologies to anneal reactor pressure vessels. Annealing is the only method currently known to repair the material degradation that occurs in a pressure vessel after prolonged operation.

Our nuclear energy activities are conducted by the Office of Nuclear Energy, Science and Technology. $248.1 million is requested for non-defense research and development programs, which include the advanced light water reactor program, the Department's activities to address critical technology issues associated with the long-term operation of current U.S. nuclear plants, the production of power sources for NASA missions, development of electrometallurgical technology to treat DOE spent fuel, and the production of various isotopes critical for medical, industrial, and research purposes. In addition to the $72.2 million request for international nuclear safety and nuclear security programs in the Other Defense Activities appropriation, $27.8 million is also requested in the Uranium Supply & Enrichment Activities appropriation for residual uranium program activities. The total request for the Office of Nuclear Energy, Science and Technology is $348.1 million.

The Termination program requests $79.1 million to close-out the Gas Turbine-Modular Helium reactor design work and shutdown the EBR-II reactor at Argonne-West.

The Advanced Radioisotope program is funded at $40 million to complete the construction of the Radioisotope Thermoelectric Generators for NASA's Cassini probe to Saturn, which will be launched in October 1997, and to provide Radioisotope Heater Units for the December 1996 Mars Pathfinder mission.

The Nuclear Technology Research and Development program is funded at $30 million to continue development and demonstration of electrometallurgical treatment technology, which has the potential to condition DOE spent nuclear fuel and prepare it for long-term storage and ultimate disposal.

The University Nuclear Science and Reactor Support program request of $7.0 million will provide critical support to nuclear science and engineering programs at U.S. universities and colleges and provide needed safety upgrades and fuel services for their research reactors. Part of these funds, unlike the previous year, will be used to support priority safety and operational upgrades at the nation's university research reactors. In addition to their important educational role, these reactors are essential to a wide range of scientific endeavors, including materials research and isotope production.

INVESTMENTS TO SUSTAIN U.S. SCIENTIFIC LEADERSHIP

The nation wants a future in which advances in science and technology contribute to our national security and energy resources, deliver solutions to environmental problems, continually replenish our knowledge base, and spur new technological innovations--and even entirely new industries--that assist economic productivity. The Department's science programs, as presented in our FY 1997 budget request, are aimed at helping meet these needs.

Fundamental and applied research supported by the Department of Energy advances U.S. world leadership in science, mathematics, and engineering. The Department's national laboratories play a critical role in large scale, multi-disciplinary research in the national interest.

Achievements from our continued investment in science and technology have been increasingly recognized around the world. Four of the five 1995 Nobel Prize recipients in chemistry and physics were scientists who worked at our facilities or were supported by the Department's predecessor agencies. In 1995, 33 of R&D Magazine's R&D 100 Awards went to Department of Energy supported technologies. Since the awards began in 1963, the Department has received more awards than all other government agencies combined, and more than twice as many as the top industrial winner, General Electric.

Over the last three years, the Department's efforts have set world records for fusion power, enough to power more than 2,000 homes if sustained on a continuous basis--helping to demonstrate the potential feasibility of fusion as an inexhaustible energy supply. In 1994, our

efforts assisted the location of a gene that contributes susceptibility to breast cancer in some women. Also, in 1995, we announced the discovery of the top quark, the last of a family of six subatomic particles predicted by current scientific theory.

The FY 1997 budget request for the programs of the Office of Energy Research totals $2.549 billion. Within the Energy Supply Research and Development appropriation, our request of $1.54 billion supports a number of major activities. A request of $255.6 million for Fusion Energy Sciences pursues a restructured fusion research program as recommended by the Fusion Energy Advisory Committee. Severe funding cutbacks in FY 1996 required the program to shift emphasis toward basic science research in support of fusion as an energy source.

For Basic Energy Sciences, $653.7 million is requested to support the continuation of ongoing research activities and operation of all user facilities. This level of funding will support ten scientific user facilities, research and design activities for a spallation neutron source, construction of the Combustion Research Facility, as well as high-priority peer reviewed research.

A total of $379.1 million is requested for Biological and Environmental Research activities, which is a net decrease of $27.3 million from the current appropriation. This program supports environmental research focusing on the consequences of energy production and use, risk assessment, transport of pollutants, environmental restoration and bioremediation technologies. Also supported is research in global climate change and health topics such as participation in the human genome project.

A total of $158.1 million is requested for a restructured program called Computational and Technology Research. This program supports technology transfer activities with industry partners, the study of advanced computing applications and makes high performance computers available to DOE researchers. In addition, funds are included for a joint Energy Research-Defense Programs DOE 2000 Initiative to develop tools to enable geographically separated scientists to work together more effectively.

Within the General Science and Research appropriation, $1.009 billion is requested for High Energy Physics and Nuclear Physics. For High Energy Physics, $679.1 million is requested to continue research that seeks an understanding of the nature of matter and energy at the most fundamental level and the basic forces which govern all processes in nature. The FY 1997 request includes two notable activities: support for the U.S. formal negotiation of its involvement in the CERN Large Hadron Collider project, and continued research on new accelerator concepts, particularly linear collider concepts. Funds are requested to maintain the construction schedule for the Fermi Main Injector.

For Nuclear Physics, $318.4 million is requested to continue research that furthers knowledge of the structure of atomic nuclei and the fundamental forces required to hold nuclei together. Funds also maintain support for scientific facilities initiatives which were started in 1996.

INVESTMENTS TO CLEANUP WEAPONS PRODUCTION SITES

The nation wants a future in which contaminated sites from 50 years of nuclear weapons production have been cleaned up as cost-effectively as possible and have been converted to other productive uses. Since 1993 we have made considerable progress. The Department is delivering real, tangible results.

In January 1993, the Department's environmental management program did not have a comprehensive estimate of what it will cost the nation to cleanup the environmental legacy of the Cold War at former nuclear weapons production facilities. The majority of environmental restoration funding was directed at studies instead of actual cleanup work and real environmental risks such as the possibility of explosion at the high level radioactive waste tanks at Hanford. Since then, we have released a Baseline Environmental Management Report with site-by-site cost estimates through the year 2030. We have dramatically increased the amount of actual cleanup and our percentage of actual cleanup versus studies and overhead has gone from 35 percent in FY 1993 to 67 percent in FY 1997. Additionally, we have significantly reduced the threat of an explosion of the Hanford waste tanks.

We have cleaned up 194 large-scale contaminated sites out of an original 705. In 1995, the contaminated material we cleaned up constituted approximately five million cubic yards of mill tailings, soil, rubble, and debris--enough to fill a hole the size of a football field that is over half a mile deep. This month the Department started operations at the nation's largest nuclear waste processing facility, the Defense Waste Processing Facility at the Savannah River Site. The facility will process 34 million gallons of radioactive waste in 51 underground storage tanks by 2020. The $2.4 billion project will fill about 6,000 canisters over its 25-year mission.

We are better managers of this ambitious cleanup. We have established a comprehensive baseline of the scope of work which allows us to manage according to risk and compliance requirements. We have established performance-based contracting that ties payment to performance instead of the level of effort. The new Rocky Flats contract awarded to Kaiser-Hill ties fully 85 percent of the contractor's fees to meeting performance goals.

We are investigating better ways to get the job done such as privatizing the cleanup of contaminated materials. By shipping 186,987 gallons of uranium-contaminated nitric acid for reuse in Sellafield, England, we saved $37 million in waste treatment costs.

We have reduced the budget for Environment, Safety and Health by over 20 percent without lessening our commitment to health and safety through consolidation of similar functions and by placing responsibility for safety with line managers in the field.

The Department is also responsible for the long-term storage and disposal of spent fuel rods and other high-level radioactive waste. Since 1993, one of the Department's primary objectives has

been to move aggressively to determine the suitability of Yucca Mountain, Nevada for a nuclear waste repository.

Tunneling at Yucca Mountain, which began in 1993 is now approaching three miles and is over 50 percent ahead of schedule. It is providing important data and direct observation within the proposed repository geologic formation. The repository siting studies are a directed effort to address key issues of repository safety. Although we did not achieve the funding mechanism or the level of funding we sought in FY 1996, the program will maintain its momentum and close the key scientific and engineering issues to allow us to make a viability determination by 1998.

Environmental Management

The total FY 1997 budget request for the Environmental Management program is $5.878 billion. In addition to the budget request of $5.409 billion for the Defense Environmental Restoration and Management, $651.4 million is requested under the Energy Supply Research and Development appropriation and $240.2 million is requested under the Uranium Enrichment Decontamination and Decommissioning (D&D) Fund. This amount is offset by a Government contribution of $376.6 million and, through enactment of new legislation, a collection of foreign fee receipts of $45.9 million, both of which will be deposited into the Uranium Enrichment D&D Fund.

The FY 1997 request for programs within the Defense Environmental Restoration and Waste Management appropriation is $5.409 billion. Included in this request are Environmental Restoration activities at a level of $1.76 billion. These activities represent the highest percentage of the program budget, 32 percent, and reflects the program's FY 1997 emphasis on actual clean-up rather than issuing paper studies.

Waste Management activities are proposed at a level of $1.54 billion. This request continues ongoing regulatory compliance efforts to bring the DOE complex in line with environmental, safety and health requirements. Included in this request are funds to meet the conditions of the Idaho agreement for transuranic waste storage.

Nuclear Material and Facility Stabilization activities are proposed to be funded at $903.8 billion to continue work reducing environmental, health and safety risks, lowering the mortgage cost of doing business, accomplishing commitments and meeting milestones. The program goal is to lower the mortgage cost of doing business from about $1.7 billion in FY 1996 to $0.7 billion by 2010, and to complete the program's mission in the FY 2005-2010 time frame.

Technology Development activities are proposed for funding at a level of $303.8 million to address advanced technology needs in the areas of waste treatment, disposal, containment, and remediation systems, and to accelerate their commercial availability.

In addition, budget authority in the amount of $185 million is requested to conduct a privatization pilot program at the Tank Waste Remediation System at Hanford to investigate alternatives in the management of waste treatment.

The FY 1997 budget request for non-defense Environmental Management programs is $651.4 million, the current level of appropriation. Within this account, $358.2 million is requested for Environmental Restoration. The FY 1997 program will emphasize actual cleanup of sites and will continue characterization and assessment activities.

For Waste Management, within non-defense Environmental Restoration and Waste Management, a total of $199 million is requested. At this level the program will continue ongoing regulatory compliance efforts and priority activities such as continuing high-level waste treatment at the West Valley Demonstration Project, and implementing site treatment plans as negotiated through the Federal Facilities Compliance Act.

For Nuclear Material and Facility Stabilization, a total of $91.4 million is requested to continue to reduce risk by deactivating surplus, contaminated facilities and stabilizing radioactive materials.

The Department requests $240.2 million from the Uranium Enrichment Decontamination and Decommissioning (D&D) Fund. In FY 1997, a government contribution from the Defense Environmental Restoration program of $376.5 million will be deposited into the Uranium Enrichment D&D Fund. In addition, an assessment to domestic utilities of approximately $163 million and a collection of foreign fee receipts of $45.9 million are also planned to be deposited into the Fund. The remaining balances will remain in the Fund for future cleanup at the gaseous diffusion plants.

Environment, Safety, and Health

Safety is an investment that allows us to target our most urgent risks, use our limited resources most efficiently, and do our work most effectively. The FY 1997 budget request for the Office of Environment, Safety and Health (ES&H) is $176 million, approximately seven percent below last year's level. Despite less funding, the Office is able to "do more with less" through efficiencies achieved in reduced support service contracts and consolidation of training and other administrative functions. Last year we reorganized the Office of Environment, Safety and Health. These efforts have paid off.

Protection of the environment, safety and health of DOE workers and those living in the surrounding communities is the clear responsibility of DOE's program managers. ES&H technical experts work with program managers to provide tools to manage safety more effectively and at less cost to the taxpayers. Through several joint projects, we have shown that we can do our work better, more safely, and at less cost by integrating safety into the planning and execution of our work.

At Fernald, for example we avoided nearly $2 million in costs by recognizing and avoiding unnecessary work because safety personnel worked side-by-side with engineers, planners, and other workers to "build in" safety and health concerns into the planning of work. We expect this "work planning" approach to become standard practice throughout the DOE complex and continue to save taxpayers millions of dollars year after year while also making work safer.

Another effective safety tool is the ongoing development of the "Necessary and Sufficient Process" - a graded approach to safety standards that tailors them to actual work. In a pilot application of this process at a major Hanford facility, we were able to greatly reduce worker exposure while cutting costs by 50 percent. We hope to use this process to proceed with safe and timely stabilization of facilities at Rocky Flats and other locations throughout the DOE complex.

Comprehensive assessments provide DOE management with validated, professional appraisals of a site's performance, greatly aiding the program's ability to target resources to areas of greatest risk to workers, the public, and the environment. The foundation of the new approach is an analytic framework or "template" that clearly articulates the principles and operational elements of sound ES&H management programs. The assessments have identified where we are doing well, where we have to work harder, and aid in spreading good practices among our sites.

The Office of Health Studies sponsors domestic and international studies to increase our understanding of the radiation health effects and the environmental and occupational health impacts of DOE operations. Investigations of the relationships between exposures to radiation and chemical and consequent health effects among populations are a critical public health function that is key to designing effective strategies. This budget request reflects our commitment to promote and to protect the health of all DOE workers as well as the health of the communities that have hosted our sites.

The FY 1997 request for these activities is divided into two parts, defense and non-defense. The FY 1997 request for the defense portion of the program is $63.8 million. The non-defense request is $112.2 million.

Civilian Radioactive Waste Management

In response to a reduced appropriation for FY 1996, the Office of Civilian Radioactive Waste Management has revised its program approach to regain a target of completing a license application by 2002 if Yucca Mountain is determined to be a viable site in 1998. This schedule could accommodate the initial emplacement of waste in 2010. This approach, however, assumes that the regulatory basis for the license application can be updated to recognize our knowledge of the site and the repository proposal that a decade of scientific and engineering work now affords us. The program will issue a revised program approach and propose the regulatory changes required within the next few months.

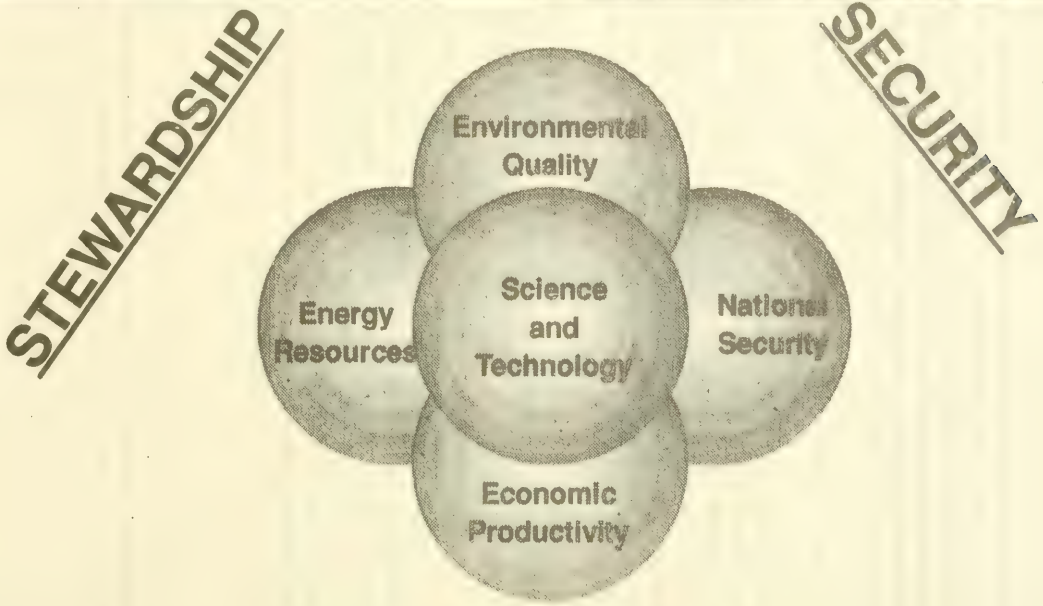
The FY 1997 total request of $400 million provides $339.3 million to continue these site characterization activities at the Yucca Mountain, Nevada site. This includes an increase of $89.3 million to augment underground excavation and tunneling of the Exploratory Studies Facility and to support underground testing at the facility. Additionally, $10 million is requested for Waste Acceptance, Storage and Transportation activities.

CONCLUSION

In closing, I would like to return to the message on which I began.

By almost any measure, it is clear that during the past three years we have dramatically reformed the Department of Energy. Our programs now deliver more results at a lower cost. We have a greater sense of the long-term purpose of our efforts. We have codified the specific outcomes of our efforts in a Performance Agreement with President Clinton, and we will be held accountable to those commitments. Again, I appreciate this opportunity to address you and look forward to your questions.

Department of Energy



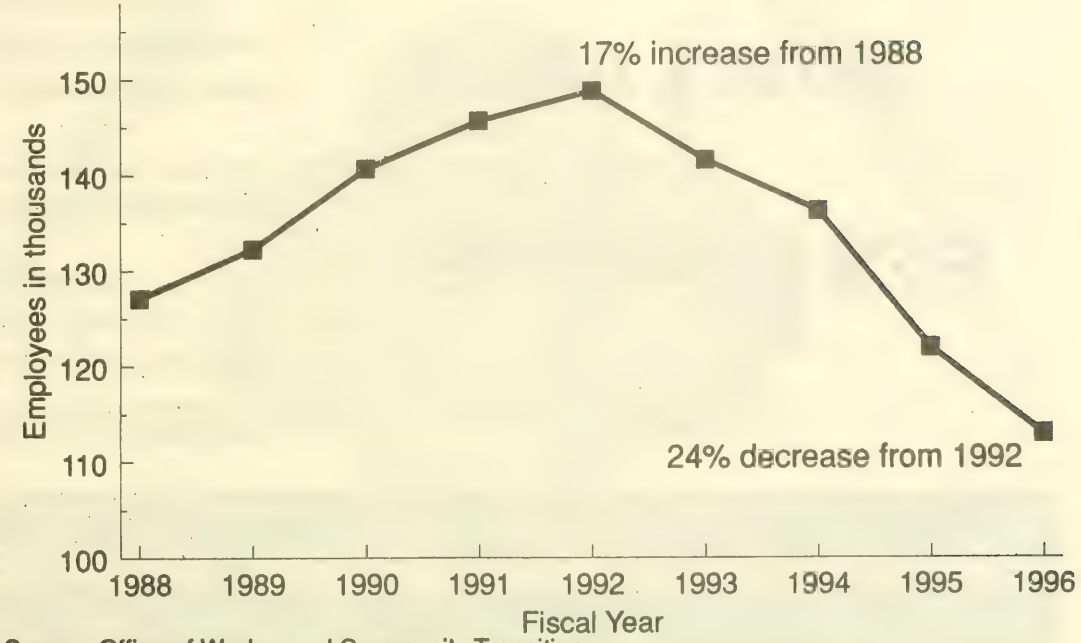
FY 1997 Budget

Return on Management Investments

Investment	Return
Strategic Planning Total Quality Management	Budget ↓ $3B
Contract Reform Contractor Freeze	
Strategic Alignment Galvin Lab Review Yergin Review	Staff ↓ 30,000
Privatization Openness Initiative	Regulations ↓ 50%

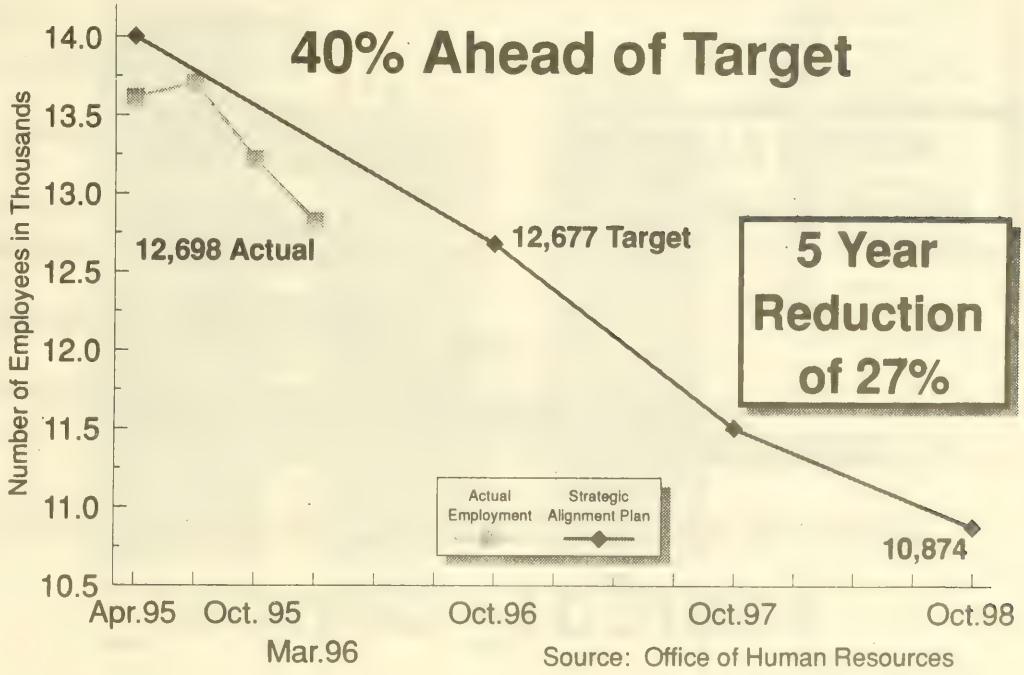
Sources: FY 1993 enacted vs FY 1997 request,
Office of Worker and Community Transition, Office of Human Resources

Contractor Employment Reductions



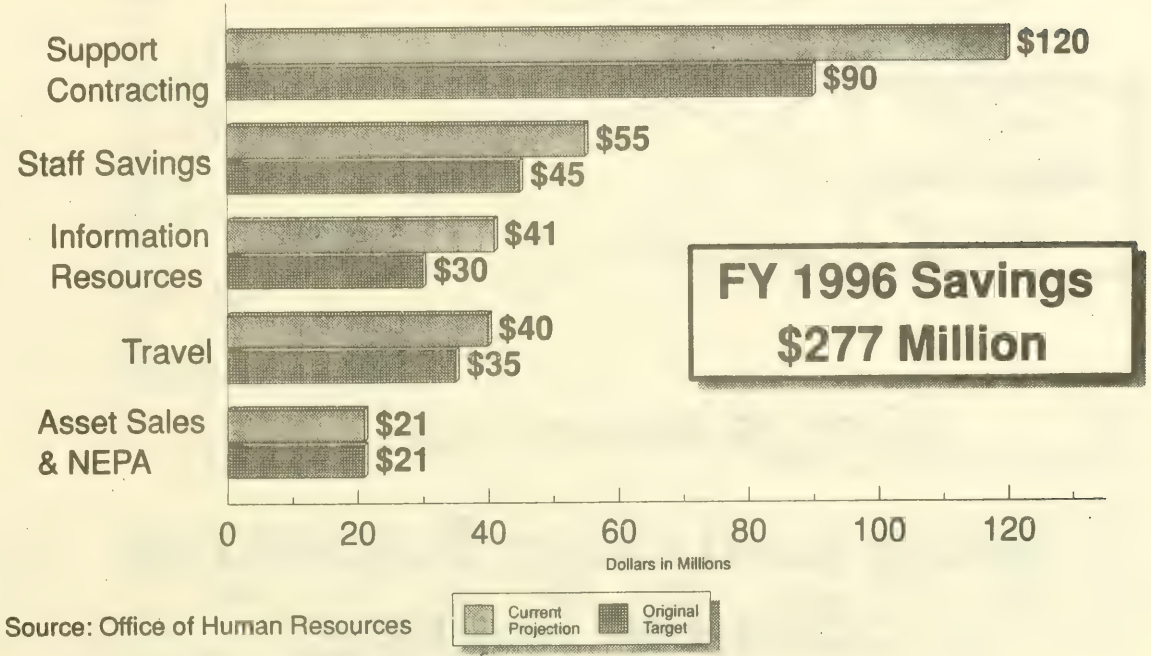
Source: Office of Worker and Community Transition

Federal Staffing: Exceeding Alignment Goals



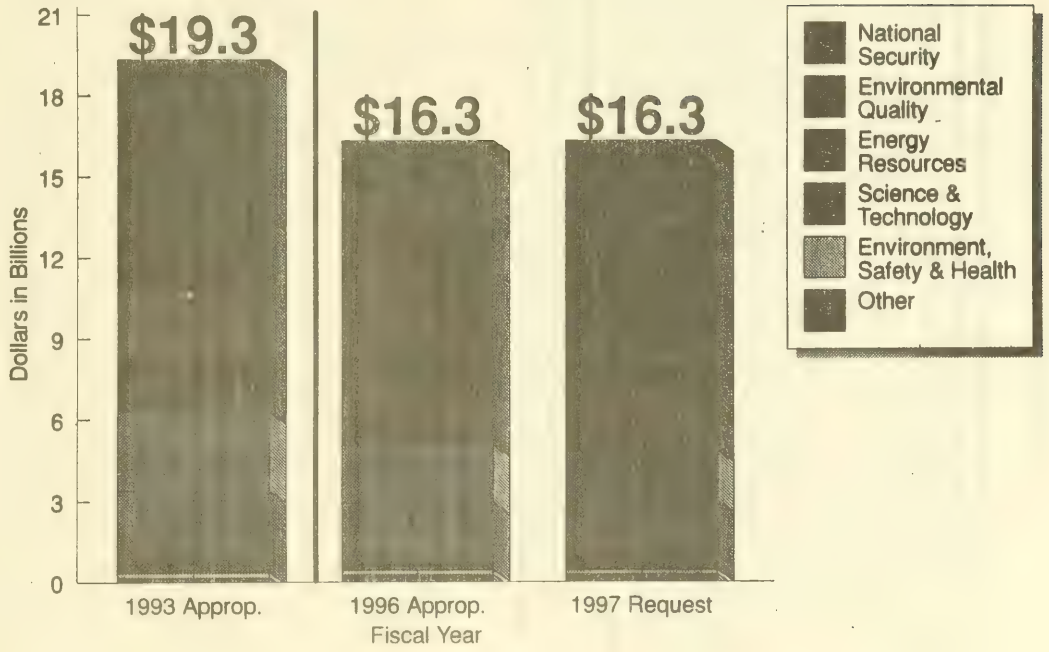
Tracking Progress

Cost Savings by Category -- Fiscal Year 1996



Source: Office of Human Resources

Department of Energy Budget



SOLAR AND RENEWABLE TECHNOLOGIES

Mr. Myers. Solar and renewable energy technologies funding is increased this year. However, there seems to be a change in emphasis. Previous efforts emphasized expanded use of these technologies in this country to meet energy needs. Now the emphasis is clearly on marketing these technologies to other countries. Why is the Department of Energy the appropriate agency to market these technologies?

Mrs. Ervin. The principal motivation for DOE spending on renewable energy programs has been and continues to be the promise that these technologies offer for meeting U.S. energy needs. Assistance to the emerging domestic renewable energy industry in its efforts to penetrate international markets is an important but secondary role for the Department. In several technology areas, international markets currently offer a growth opportunity for U.S. firms. This is particularly true for the geothermal, wind, and photovoltaic industries where higher prevailing electricity cost in certain areas of the world creates attractive potential markets. Participation in these markets helps strengthen U.S. firms financially, improves the U.S. position relative to its international competitors, and helps the technologies reach domestic performance and cost goals. It is in the interest of the entire nation that these efforts succeed.

FISCAL YEAR 1997 BUDGET REQUEST

Mr. Myers. The nuclear energy research and development program is also changing emphasis from expediting design and certification of advanced light water reactors to a life extension program for existing nuclear reactors. Please discuss this change in direction.

Secretary O'Leary. The design and certification program for advanced light water reactors (ALWR) is nearing completion. In 1996, the Nuclear Regulatory Commission (NRC) should complete its rulemaking process and certify the design of the two large evolutionary plants, the Advanced Boiling Water Reactor (ABWR) and the System 80+. The First-of-a-Kind Engineering (FOAKE) program for the ABWR will also be completed in 1996. General Electric recently announced that it will terminate work this year on the existing Simplified Boiling Water Reactor program. Thus, after 1996 only the Westinghouse AP600 will remain in the cost-shared program for design certification and FOAKE. The AP600 is expected to receive Final Design Approval from the NRC in 1997 and design certification in 1998. The AP600 FOAKE program is expected to be completed in 1998 also.

Based on energy use projections by the Energy Information Administration and the industry's Nuclear Energy Institute, no large electricity generating units will be needed in the United States to provide increased base load capacity for another 5-10 years. The 110 existing commercial nuclear power plants in the United States will continue to be needed to provide 20 percent or more of the total electricity generation capacity. Many of these plants are approaching middle age and will reach the end of their initial NRC 40-year licensing period between 2010 and 2015. Most of the operators of these plants are expected to apply for license extensions for up to an additional 20 years. As these plants age, some important components may begin to degrade. The Department, in order to assure that U.S. plants can operate safely for the long term, proposes to investigate significant, generic technical issues associated with these aging U.S. plants. Among current issues that DOE and industry are evaluating are reactor pressure vessel embrittlement from neutron irradiation, cable aging, and long-term effects of fatigue stresses on reactor plant components. In addition, the Department is managing technologies to upgrade the instrumentation and control systems in U.S. nuclear plants. To date, DOE has contributed modest amounts to these programs, but intends to increase its involvement in the next few years.

ENVIRONMENT, SAFETY AND HEALTH

Mr. Myers. The budget continues to reflect significant levels of spending for health and safety activities throughout the Department of Energy complex. After many years of effort to upgrade facilities and procedures, can you tell us how much safer the complex is as a result of this effort?

Secretary O'Leary. I believe that the Department has made strides in "making DOE safer." I base this conclusion on the strength of our safety-critical programs and systems, the accountability of its managers, the engagement of its workers, and ultimately, the results achieved in terms of the safety record itself.

In terms of accident and incident statistics, DOE-wide trends have been improving despite a rapidly growing environmental cleanup mission and its attendant hazards. Three years ago, the rate of lost workdays due to occupational injuries or illnesses was about 59 per 200,000 person-hours in Environmental Management operations. Today, this figure has been cut by 45 percent. The Fernald facility, where DOE confronted serious safety deficiencies in the 1980's, received a 1995 safety award from the State of Ohio recognizing two million person hours worked without a loss time accident. The Savannah River Site recently recorded 9.5 million hours without a lost work day due to an on-the-job injury. At Hanford, a 40 percent reduction in recordable injuries and illnesses was recorded last year at the high-level waste tank farm.

In terms of radiation exposure, collective dose, cumulated over all monitored workers declined by 31 percent between 1992 and 1994, and average dose to workers with measurable dose declined by 20 percent over the same time.

However, I want to emphasize that DOE still faces major safety challenges. DOE is confronted increasingly with the significant hazards associated with thousands of aging facilities being readied for decontamination and decommissioning, and with the many thousands of largely inexperienced workers newly charged to accomplish this task over the coming decades. The construction and demolition activities associated with these new missions are among the most hazardous activities to which workers can be exposed. Two recent fatalities and several serious injuries since the beginning of this year underscore the importance of continued vigilance on accident prevention at DOE sites.

From this standpoint, DOE is focussing increasing attention on accident prevention strategies that improve programs and systems from a safety standpoint, strengthen line management accountability and involve workers in their safety programs. These "upstream" factors have the greatest likelihood of preventing "downstream" accidents.

GENERAL

Mr. Myers. Funding for the weapons activities program has increased from $3.5 billion in fiscal year 1996 to $3.7 billion in fiscal year 1997. This program includes several initiatives such as the National Ignition Facility and tritium production which will require significant increases in funding in the outyears. How does the Department propose to meet these increased needs within the outyear funding ceilings?

Secretary O'Leary. You are correct in pointing out that there is a large financial investment required to provide Defense Programs with the physical infrastructure needed to provide high confidence in a safe and secure nuclear stockpile without underground nuclear testing. An additional investment will be required to implement our plans for modernizing the weapons complex, as detailed in the Stockpile Stewardship and Management Programmatic Environmental Impact Statement. In total, these investments will require us to maintain a roughly $4 billion a year funding level for the next ten years. However, the Department and the Administration is committed to funding these activities and they are accommodated within the funding envelope outlined in our National Security Programs Five Year Budget Plan. The Gross funding level for these programs reflect funding that is commensurate with full support of the Administation's programmatic commitments over time. The offsets shown will come from potential savings within the Department of Energy, possible additional user fees, and potential adjustments to discretionary programs in other agencies.

COST OF REPROCESSING

Mr. Myers. Is the Department aware of any studies which have analyzed the cost of reprocessing civilian spent nuclear fuel versus placing it into a repository without further reprocessing?

Secretary O'Leary. The Department is aware of four studies that compare the costs of reprocessing spent fuel with the costs of direct disposal:

1. System Study of Alternative Waste Management Techniques, compiled by the Project Group for Alternative Waste Management Techniques, Kernforschungszentrum Karlsruhe (Germany), December 1984 (translated from the German for Oak Ridge National Laboratory, ORNL-TR-86/31).

2. The Economics of the Nuclear Fuel Cycle, Nuclear Energy Agency (NEA) of the Organization of Economic Cooperation and Development (OECD), June 1993.

3. National Academy of Sciences/National Research Council, Nuclear Wastes: Technologies for Separations and Transmutation, National Academy Press, Washington, D.C., prepublication copy, 1995.

4. "Chemical Stabilization of Commercial and Defense-Related Spent Fuel at the Savannah River Site," Westinghouse Savannah River Company, Doc. No. NMP-PLS-950239, August 16, 1995.

Mr. Myers. If so, what did the studies show were the costs and benefits of each approach?

Secretary O'Leary. System Study of Alternative Waste Management Techniques compared direct disposal of spent fuel with a disposal system involving commercial reprocessing and recycling of recovered plutonium and uranium. The study concluded that the reprocessing cycle, assuming reprocessing would take place at German facilities, increased the cost per kWh by about 47 percent. The increased cost from reprocessing was calculated to be much higher (on the order of 150 percent) if the reprocessing services were purchased abroad. The study also concluded that there are no significant safety differences between the two cycles, taking both short-term and long-term risks into account, despite the significantly higher plutonium inventory in the repository in the direct disposal case.

The Economics of the Nuclear Fuel Cycle compared direct disposal of spent fuel with a reprocessing system, assuming low-risk government financing for the reprocessing. It showed that the fuel cost of the reprocessing cycle is about 14 percent higher than the once-through fuel

cycle. This finding represents an addition of about 0.8 mil/kWh to the generating cost and about a 1.5 percent increase in the total generating cost of wholesale electricity.

Nuclear Waste: Technologies for Separation and Transmutation examined the same scenario evaluated in the Nuclear Energy Agency study, but assumed reprocessing would be conducted in the United States as a private venture financed by industry, rather than government. The report found that private financing raised the estimated cost increment from reprocessing to about 4 mils/kWh, representing an increase of about 70 percent in fuel-cycle cost and about 8 percent in the total generating cost of wholesale electricity.

The report also considered the costs of systems using reprocessing followed by transmutation of radionuclides that are troublesome from a long-term waste management perspective. These systems would be optimized for waste management benefits (e.g. elimination of long-lived radionuclides), rather than for the economical generation of electricity (the scenario in the other studies described above). The report concluded that the increased cost of such systems, compared to once-through direct disposal for 62,000 metric tons of spent fuel, "is uncertain but is likely to be no less than $50 billion and easily could be over $100 billion if adopted in the United States." The cost of generating wholesale electricity would increase by two to seven percent, representing a total increase of about $25 to over $80 billion.

Finally, the report examined reductions in long-term radiation doses that could be achieved by separation and transmutation. The study concluded that "Taken alone, none of the dose reductions seem large enough to warrant the expense and additional operational risk of transmutation."

Chemical Stabilization of Commercial and Defense-Related Spent Fuel at the Savannah River Site examined the use of existing facilities at Savannah River to reprocess both commercial and Department of Energy-owned spent fuel. It found that reprocessing could reduce the total disposal costs for civilian spent fuel from about $11 billion to about $9 billion. However, the findings do not take into account the large-scale transmutation program assumed by the study, which the National Academy of Sciences estimates could cost between $50 billion to $100 billion.

HEADQUARTERS STAFFING

Mr. Myers. Using the Department's projected employment levels of 18,484 for fiscal year 1997, the numbers indicate that 37% of the employees are located at headquarters and 63% are in the field. If the power marketing administrations and the Federal Energy Regulatory Commission employees are removed from this mix, the total number of DOE employees is 12,096, with 44% located at headquarters and 56% in the field. Can you explain why the Department, which has an extensive structure of field offices (with full services) who actually manage the contractor-operated facilities, needs such a large percentage of staff at headquarters?

Secretary O'Leary. The Headquarters staff identified in the Department's projected employment levels for FY 1997 are not all physically located in the Washington, DC area. Approximately 600 are duty stationed in the field. Examples of this include 160 employees assigned to the Office of the Inspector General and 108 employees of the Office of Civilian Radioactive Waste Management at the Yucca Mountain site. Of the roughly 5,000 remaining, approximately 1,880, or 37%, are duty stationed in or near our Germantown, Maryland facility.

In addition, much of the direct mission work of the Department is performed at headquarters. One example is the work performed by the 400 employees of the Energy Information Administration. Other examples are Energy Efficiency with 500 FTEs and Energy Research with 300 FTEs that do not rely on the Department's field structure and carry out program direction and contractor oversight out of their headquarters organizations.

Other program and mission-dedicated staff at headquarters are responsible for the development and implementation of management strategies necessary to fulfill the Department's programmatic commitments and landlord responsibilities in support of National and corporate goals and objectives. Responsibilities include program planning and development of programmatic performance objectives, budget development and justifications, assignment and authorization of work to the Field, allocation of resources, issuance of technical program guidance, and conducting assessment of programmatic performance to ensure that safety and business management objectives are met.

Lastly, it should be noted that about 1,800 FTEs, or 10% of the total projected employment, are assigned to traditional staff support elements like the Office of the Chief Financial Officer or the Office of Human Resources and Administration. The FY 1997 staffing level is over 400 positions, or 18%, below the number authorized these same elements in FY 1995.

DEPARTMENTAL SAVINGS

Mr. Myers. In December 1994 you announced a plan to reach $14.4 billion in savings. Please identify how those savings have been achieved to date when the Department in fiscal year 1996 requested over $1 billion more than the previous year's funding, and this year the Department is requesting a funding level $400 million higher than last year's appropriation. Identify by specific category what savings have been achieved to date relative to the $14.4 billion. What are the Department's plans to achieve future savings?

Secretary O'Leary. Savings can clearly be seen by comparing the Department's FY 1996 and FY 1997 requests for accomplishing Department's mission to the amount that was required in FY 1993 for the same purpose. In FY 1993, this amount was $19.3 billion - the amount enacted for that year. By FY 1996 and FY 1997, with implementation of savings initiatives, the Department required only $16.3 billion to accomplish its mission. Furthermore, although the request for E&WD Appropriation funding increases by $393 million between FY 1996 and FY 1997, this amount is more than offset by decreases in the request for appropriations for Interior and Related Agencies (-$338 million) and other adjustments, resulting in a total DOE FY 1997 funding request that is slightly less than the FY 1996 comparable appropriated amount.

As indicated by the above reductions, savings have already been taken out of the budget or 'achieved'. Savings are also clearly visible in terms of reductions in employment. Since January of 1993, 30,000 contractor workers have left the employment of the Department. Similarly, the number of federal employees has fallen by 1,000. Additionally, 1,380 federal staff positions are being eliminated in FY 1996 alone. As to additional specific examples of savings, asset sales have reached $4.38 million. Three office locations in Washington, D.C. have been vacated ahead of schedule. DOE Directives/Orders have been reduced by 50% since 10/93, one year ahead of goal. And DOE's Budget Process and Budget Documents have been streamlined, and the number of pages in the budget reduced by 28%. These are real reductions which result in real savings. Note that our goal for savings was announced as $14.1 billion.

Other savings within in the $14.1 billion were projected to be achieved by means such as: improved program effectiveness and efficiency in the environmental management of nuclear waste clean-ups ($4.4 billion); transfer of Highly Enriched Uranium to the United States Enrichment Corporation for future sale ($0.4 billion); sale of the Alaska Power Marketing Administration ($0.1 billion); sale of a National Petroleum Reserve ($1.6 billion); Strategic Alignment Initiatives (1.8 billion) including reduced use of contractor support services, decreased travel costs, and streamlined information resources management activities; and, implementation of management efficiencies in the DOE Laboratories ($1.4 billion) and in other departmental research efforts ($1.2 billion).

Mr Myers Despite your efforts to move the Department toward customer-oriented behavior and efficiencies, each of the major reviews of the Department as well as a recent review of the environmental management program by the National Research Council indicate that many obstacles to progress and efficient operations are organizational As the National Research Council indicated, "What happens is driven too often by the internal needs of the organization charged with the remediation work rather than by the overall goal of environmental remediation " While this statement referred to the cleanup program, I think many would agree that it also holds true for much of the Department How can you explain this fundamental lack of change throughout the Department? Please note the previous Secretary, Admiral James Watkins, also spent much of his tenure trying to "change the culture" of the Department."

Secretary O'Leary The United States Department of Energy has changed dramatically during the Clinton Administration The end of the Cold War has made it possible for us to reshape our vision and implement more sharply focused goals increasing efficiency and the choice of energy sources, support basic and applied research in science and technology, addressing environmental quality issues and a continued contribution to a secure national defense Key to achieving these goals is a change in how we do our business.

More than ever, Congress and American taxpayers are holding us accountable to deliver superior value with increasingly limited resources. Calls for a government that works better and costs less require us to apply the best management practices We must do more with fewer resources; to achieve this, we must improve productivity.

Since 1993, we have achieved measurable results that demonstrate the culture of the Department is changing:

* **Changes In the Way We Do Business:** We have achieved budget reductions of $3 billion (FY1993 enacted vs FY1997 request), reduced staff (federal and contractors) by 30,000, and reduced the number of Orders and rules by 50 percent by making investments in strategic planning, implementing contract reform; and acting on recommendations of the Strategic Alignment, Galvin Task Force review of the National Laboratories and Yergin Task Force review of Energy Research and Development; and the privatization initiative.

* **Openness:** The end of the Cold War has enabled us to pursue an openness initiative at the Department. Over 10 million pages of information will be declassified by FY1997.

* **Implemented Standards and Measures:** The signed 1995 and 1996 President's Performance Agreement with the Department sets specific performance measures on a wide range of DOE activities, including waste treatment, weapons dismantlement, reassessing the appropriate size and scope of the nuclear weapons complex. The Agreement emphasizes and reflects the vision, goals, priorities, and expectations of the Department. We have been measuring our progress against the commitments in the Agreement and are continually improving our measures to be

more outcome-based.

* **Baseline Data Developed to Measure Customer Satisfaction:** 73% of external customers surveyed are satisfied or very satisfied with their experiences with the Department overall, (87% customer satisfaction in Energy Efficiency and Renewable, 95% customer satisfaction in Energy Information Administration, and 87% customer satisfaction with Department Laboratories); 60% of survey participants feel that their level of trust in the Department exceeds their expectations; 40% of survey participants perceive the Department has become more responsive to their needs in the past 12 months.

* **Focused on Process Management:** Fundamental processes which govern how the Department operates are cumbersome, ineffective, and drain our employees of energies that could be spent more productively in other ways. We have focused on process management, identified cross-cutting processes ripe for reengineering and provided skill building so that we can eliminate unnecessary steps to better focus on mission results and customer requirements. Examples include: National Environmental Policy Act process improvements will result in $26 million in savings projected over 5 years due to reductions in document preparation, Environmental Impact Statement preparation, categorical exclusion application costs, and environmental assessments due to additional categorical exclusions; Freedom of Information Act case closures are up 195%; Human Resources and Administration facilitated a 66% reduction in field directives and 50% reduction in procurement regulations.

* **Quality-Based Personnel Systems:** We have made changes to our personnel practices to ensure quality behaviors are a part of placement and performance decisions. Examples include: instituting a multi-rater feedback performance appraisal system for senior management; incorporated core competencies such as customer orientation, teamwork and quality advocacy, into existing performance plans; and delayered the organization by creating flatter structures to empower employees; and implemented the Energy Quality Award process to recognize organizations for service to customers.

* **External Recognition for Operational Excellence and Customer Satisfaction:** We have received external recognition for operational excellence and customer satisfaction: Albuquerque Operations, Sandia National Laboratory, Los Alamos National Laboratory and Westinghouse Electric Corporation - Waste Isolation Division, received the 1995 New Mexico Quality Awards; Nevada Operations (Office of Administration) is a finalist for the 1996 United States Senate Nevada Productivity Award;

National Performance Review Hammer Awards were awarded to the Chief Financial Office, Albuquerque Uranium Mill Tailings Remedial Action Team, Environmental Management Employee Improvement Process, Oak Ridge Columbus Initiative, and Bonneville Competitiveness Project

We have changed and our process is ongoing We will continue to use the proven management techniques which have made Fortune 500 companies successful as we move into the 21st Century. By changing the way we do business, we strengthen our commitment to be effective stewards of the taxpayer's dollar.

Mr. Myers Is it possible that the Department of Energy as it is currently structured is not fixable?

Secretary O'Leary. On the contrary, our changing structure resulting from the Department's strategic plan and Strategic Alignment Initiative, have created a firm platform for secure energy resources, first-class basic and applied science and technology, a safe enduring nuclear stockpile, reduction in the global nuclear danger, improved quality of our environment and increased economic productivity in the United States.

The Department of Energy conducted a reasoned, thoughtful approach to identify how its activities and resources could best be aligned to achieve its National missions This initiative, Strategic Alignment, paved the way for significant savings to the Department and the American taxpayers. Not only were Alignment goals and objectives met, but a number of commitments were actually exceeded. The Department's Headquarters, Field, program, and staff offices fully internalized the Alignment effort leading to a fundamental change in the focus, structure, and culture of the Department and its employees.

Reengineering, process improvement, streamlining and other continuous improvement activities have become the norm throughout the complex. Work of low value is being eliminated, redundancies are being routed out, unnecessary rules are being terminated, broken processes are being fixed, organizational layers and bureaucracy are being reduced, and employees are being empowered to meet customer needs.

As a result of Alignment and other significant efforts (e g Galvin Task Force review of the National Laboratories, Yergin Task Force review of the Energy Research and Development program, and the Contract Reform Initiative), the Department of Energy's resources, including its Federal and contractor employees, are more fully maximized to accomplish the critical missions of the Department. These initiatives have demonstrated cost savings, the accomplishment of specific performance goals and requirements, fostered accountability, corporate focus, empowerment, increased quality, and improved performance and customer service.

RUSSIAN REPLACEMENT POWER INITIATIVE

Mr. Myers. In fiscal year 1996 the Department requested funding for a new initiative for Russian replacement power. Congress provided zero funding for this initiative. Now we find that the Department has reprogrammed over $4 million in this program without notifying Congress and received $1.2 million from the State Department for this activity in fiscal 1996. Who made the decision to execute this program despite Congressional action to the contrary?

Secretary O'Leary. In June 1995, the Gore-Chernomyrdin Commission agreed to examine the possibility of converting the fuel in Russia's three plutonium production reactors so that they continue to produce essential heat and electricity for the region while no longer producing weapons-grade plutonium. The Commission also agreed to study the option of replacing the production reactors with new nuclear power plants. The feasibility studies for these options were begun in August 1995 and completed in December 1995.

The Department planned to spend from its FY 1995 availability enough funds to complete the feasibility phase. The Department normally conducts feasibility studies within its overall program flexibilities when such expenditures do not commit us to a mortgage. The FY 1996 budget briefly described our intentions for FY 1995. There was never a decision to conduct this activity contrary to Congressional intent. The Office of Nuclear Energy, Science and Technology, the Office of Nonproliferation and National Security, and the Chief Financial Officer participated in finding the sources to fund the feasibility studies.

Mr. Myers. In the fiscal year 1996 appropriations for the Department, Congress terminated several ongoing programs including in-house energy management and civilian waste R&D, and now we find that the Department has continued these activities with other program funds. Congress had anticipated that providing zero funding for activities would terminate them. Obviously that did not happen. Will it be necessary for Congress to eliminate program funding in legislation in fiscal year 1997 to ensure Congressional direction is followed?

Secretary O'Leary. The civilian R&D activities are being terminated in accordance with the intent of Congress. However, the fiscal year 1996 appropriations did not include funding for the continued safe storage of certain civilian spent nuclear fuel being managed by the Office of Civilian Radioactive Waste Management at Idaho National Engineering Laboratory and West Valley, New York. Annual costs are about $2M. If not properly managed, this spent fuel represents a safety, health, and environmental hazard; thus funding for continued storage is essential. The Department has enough unexpended prior year funds to properly manage this fuel for fiscal year 1996. Internal agreement has been reached within DOE to transfer responsibility for this spent fuel from the Office of Civilian Radioactive Waste Management to the Office of Environmental Management beginning in fiscal year 1997. The Department's fiscal year 1997 budget includes funds for the safe storage of this spent fuel in the nuclear materials program account.

There were no funds appropriated in FY 1996 by the Congress for the In-House Energy Management Program. The IHEM program is responsible for administering a number of long-lived energy-saving projects. A number of these projects were underway at the start of FY 1996, and could not be terminated without incurring additional expenses and sacrificing the considerable future tax savings these projects will generate via their energy savings. With the exception of the cost of the federal personnel needed to provide oversight to the projects, these projects are all fully paid for with appropriations from FY 1995 and other years.

The Department has elected to continue these projects in order to realize their energy, tax savings, and environmental benefits. No new projects were started by IHEM in FY 1996, and IHEM personnel have been merged into the Federal Energy Management Program (FEMP), which was funded during FY 1996. In future years, FEMP will be the lead organization for all energy savings projects, whether started under IHEM or FEMP appropriations.

The Department continues to believe that IHEM's projects are excellent investments for the federal taxpayer. We have therefore returned with a $5.7 million request for IHEM in FY 1997, and we hope the subcommittee will look favorably on this request. Our reasons for believing that continued funding of IHEM is important are as follows.

Reducing the cost of operations by generating $700 million in energy management related savings over the next 10 years is crucial to meeting the Department's energy savings goals. By managing its energy expenses there is a potential return on investment of 25 percent.

Toward that end the Department is in the process of developing a central procurement of energy efficient chillers along with other building energy conservation measures. This central procurement will use an energy savings performance contract and will greatly simplify the process of contracting for efficient chillers using private funding. Without these central activities, each site would be required to incur costs associated with contracting for its own chiller retrofit requirements. It is likely to be the first of many central procurement for energy efficiency and renewable energy measures.

This type of centralized energy management activity along with the centralized reporting of annual energy use and management of ongoing energy projects funded prior to FY 96 are the activities that will ensure that the Department can deliver the $700 million in savings in the next 10 years. Funds requested in FY 1997 will continue these efforts and help to reduce the $60 million on outstanding cost savings projects that have been identified in previous years but remain unfunded. Funding will also help to identify the best opportunities for implementing additional procurement as well as supporting the best projects which offer greater savings from direct Federal investments than can be achieved with the use of private financing.

Mr. Myers. What is the Department's current position on adhering to Congressional guidance contained in the report language?

Secretary O'Leary. The Department is adhering to Congressional guidance contained in the report language and the civilian R&D activities are being terminated in accordance with the intent of Congress.

The In-House Energy Management program has adhered to Congressional guidance and report language.

PROGRAM TERMINATIONS

Mr. Myers. For each of the programs terminated by Congress in the fiscal year 1996 appropriations bill and report, indicate what follow-on activities were performed in fiscal year 1996 and the source of the funding.

Secretary O'Leary. Prior to fiscal year 1996, technology partnership activities were funded as a subprogram within the Energy Research Laboratory Technology Transfer program, and before that they were funded out of the Office of Policy. In the fiscal year 1996 budget request, the Department proposed funding the activities separately under the Office of Technology Partnerships (subsequently renamed the Office of Research and Development Management). No funding was provided for this organization in the fiscal year 1996 appropriation. Several of the underlying statutory mandates and responsibilities of the organization have been, or are in the process of being, reassigned, including the Laboratory Operations Board, the Research and Development Council activities and Technology Transfer Policy activities.

The fiscal year 1996 Energy & Water Development appropriation conference report also eliminated the Office of University and Science Education and directed that its activities be managed by the Office of Energy Research. Although the Conference report contained no specific funding directions for science and education activities, it urged the Department to consider the views in the Senate report. A total of $20.0 million was provided in the fiscal year Energy Supply Research & Development appropriation for these activities. Of this amount, up to $1.1 million was made available for severance costs for the employees of the Office of University and Science Education. In fiscal year 1996, the Office of Energy Research is conducting the Cooperative Program hands-on research opportunities and the University programs; twenty precollege science education outreach activities; and the laboratory-based research participation activities for faculty and students. The Museum Science Education and University Research Instrumentation programs have been eliminated. The Experimental Program to Stimulate Competitive Research is operating at a level of $7.0 million from within the available funding of the Basic Energy Sciences program.

Additionally, although the Congress did not direct the termination of any specific part of the fusion program in fiscal year 1996, the overall Congressional budget reductions led to a decision to terminate the Tokamak Physics Experiment project at the Princeton Plasma Physics Laboratory in September 1995. Activities performed in fiscal year 1996 have been limited to closeout and final payment of major industrial subcontracts and interdepartmental work orders. Fiscal year 1995 carryover funds designated for the Tokamak closeout were used to fund the termination effort.

The fiscal year 1996 Energy Supply, Research and Development appropriation also provided no funding for the Civilian Waste Research and Development program. The Office of Civilian Radioactive Waste Management is terminating research projects in an orderly manner and attempting to transfer custody of spent nuclear fuel, currently stored in casks at the Idaho

National Engineering Laboratory, to other programs within the Department. All funding utilized for these activities this fiscal year is from existing prior year unobligated balances.

The source of funds to continue the In-House Energy Management activities is from the Solar and Renewable, Policy and Management account. This funding permits the staff to perform required activities such as surveying over ten percent of the Department's facilities to meet the requirements of Executive Order 12902; reducing annual buildings' energy consumption per square foot by at least one percent; and initiating at least two Energy Savings Performance Contracts.

The Gas Turbine-Modular Helium Reactor (GT-MHR) program was terminated by Congress in fiscal year 1996 and $7.5 million was appropriated for termination activities. GT-MHR expenditures in fiscal year 1996 have supported activities required to terminate the program, including, the collection, packaging, shipment and disposition of Departmental supplies, equipment, and materials. Associated funding was provided by the Congress in the Nuclear Energy termination account.

Mr. Myers. For each program which was terminated, identify the number of employees administering each program in fiscal year 1995 and 1996.

Secretary O'Leary. In fiscal year 1995, eighteen people oversaw the activities that would have been managed by the Office of Research and Development Management. To date in fiscal year 1996, two people continue to oversee the various responsibilities until their reassignment is complete.

In fiscal year 1995, twenty-six employees managed the University and Science Education program. In fiscal year 1996, three employees in the Office of Energy Research are managing the Office of Energy Research University Science and Education program. In addition, one Office of Energy Research employee manages the Experimental Program to Stimulate Competitive Research.

Four full-time equivalents (FTEs) were involved in administering the Tokamak Physics Experiment program and its closeout in fiscal year 1995. In fiscal year 1996, only one half of one person's time is utilized to close out the program.

There were three Federal employees administering the Civilian Waste Research and Development program in fiscal year 1995 (two of whom were working part time on this activity) and assisting in the phase out in fiscal year 1996. There were also about four contractor employees involved in this program over the same time period.

Six FTEs administered the In-House Energy Management program in fiscal year 1995. By year-end fiscal year 1996, there will be four FTEs associated with the program.

In fiscal year 1995, there were three Departmental Headquarters employees administering the Gas Turbine-Modular Helium Reactor program. In fiscal year 1996, there is one Departmental Headquarters employee involved part-time in the termination of the program.

Mr. Myers. How many employees of these organizations found other jobs within the Department?

Secretary O'Leary. Of the eighteen staff members of the Office of Research and Development Management, sixteen found alternative placements within the Department. Of the twenty-six employees managing the University and Science Education program, twenty were placed within the Department. Of the four FTEs administering the Tokamak Physics Experiment program in fiscal year 1995, one has been assigned other work within the Department and one person's time is split between termination and other duties. No Federal employees were displaced due to the termination of the Civilian Waste Research and Development program. Those Federal employees affected by this termination will be absorbed into ongoing activities in other Departmental program areas. Of the six FTEs administering the In-House Energy Management program in fiscal year 1995, four remained in the Department to manage the program in fiscal year 1996 and one will be reassigned to other tasks within the Department. Two of the three Departmental Headquarters employees administering the GT-MHR program in fiscal year 1995 have found other jobs within the Department.

DEPARTMENTAL ADMINISTRATION FURLOUGH

Mr. Myers. Can you explain why the Department chose to furlough all employees in the Departmental Administration account rather than take the opportunity to reengineer the functions and reduce some central support activities which are already duplicated in the program organizations?

Secretary O'Leary. The Department as a part of its Strategic Alignment Initiative developed a plan for downsizing the Departmental Administration organizations by over 37 percent by the year 2000. The plan included orderly reductions in staff levels which matched workload reductions and also made maximum use of voluntary staff reductions. The funding cuts made by Congress in FY 1996 put the Department in a difficult position. There was not enough funding to implement the Strategic Alignment Initiatives which was our road map to downsizing. Moreover, through a limited use of furloughs, we believed we could more efficiently achieve our downsizing plan in FY 1996. This staged approach, during FY 1996 will enable the Department to begin implementation of a more orderly downsizing process in FY 1997 when we expect significant numbers of buyouts. We did not want to cut organizations which are essential to the missions of the Department without a plan. And, it was not feasible to merely accelerate the Strategic Alignment Initiative because the workload reductions could not be attained earlier. For example, one of our initiatives calls for outplacing the payroll function from the Department by FY 1998. Because of the time it takes to outsource this activity, while maintaining the necessary recordkeeping and reports, it was not viable to eliminate inhouse payrolling in a shorter time period. So rather than scrap our plan, we decided it was better to stay the course as close as possible and get through FY 1996 by tightening our belt as much as possible. We worked closely with the NTEU as we developed our belt tightening plan. We looked at reducing and/or eliminating as many discretionary costs as possible. We also looked at potential RIFs as well as furloughs. From a management, as well as employee standpoint, furlough was the preferred option.

GENERAL QUESTIONS

Mr. Myers. Please list all the major reviews you have directed of Departmental activities. Identify the principal recommendations of each review, and how you have implemented any of these recommendations.

Secretary O'Leary. Over the past three years, I have directed the following major reviews of the Department of Energy's activities:

I asked Robert Galvin, Chairman of the Executive Committee of Motorola, to head a task force to examine the efforts on Alternative Futures for the DOE National Laboratories and to challenge them to reach new levels of performance in meeting national needs.

I requested that the Department's employees build on our Strategic Plan by implementing a Strategic Alignment Initiative that would identify ways to better align our activities to reflect changing world conditions and changing demands on our science and technology infrastructure.

I asked a task force led by Dr. Daniel Yergin, Pulitzer Prize winning author and President of Cambridge Energy Research Associates, to look at how we could improve our energy research and development work.

As part of our Openness Initiative, I directed a Department-wide review of all classified documents—a review aimed at providing the public with information pertaining to environment, safety and health while protecting legitimate national security interests.

I have put into action most of the excellent recommendations from these extensive reviews. These recommendations have resulted in significant changes in the way the Department conducts its business.

The Galvin report on Alternative Futures for the DOE National Laboratories clearly and forcefully validated the importance of DOE's fundamental research and development missions and the national laboratories' role as a cornerstone for the nation's continuing scientific leadership. The Task Force found that the national laboratories could improve their performance by consolidating around their existing world-class research capabilities rather than seeking major new missions. Our Laboratory Operations Board, formed in response to Galvin Task Force recommendations, has been working to implement these and other Galvin Task Force recommendations.

The Galvin report found that the system for managing the laboratories was overly costly and inefficient, due to micromanagement and uncoordinated, excessive oversight by the Department, Congress, and regulators. The Laboratory Operations Board has seen to it that major administrative processes are being aggressively re-engineered at several of the laboratories in a fashion that will cut costs by tens of millions of dollars this year alone. The Laboratory Operations Board is streamlining management and oversight at our laboratories. Best business practices are being identified and applied at many labs to help improve operations and cut costs.

DOE's recent reduction, by 50 percent, in the number of DOE orders has helped to reduce the regulatory burden at the labs. Our contract reform is providing incentives for cost reductions and cost avoidance. Through these efforts, we expect to reduce our research and development overhead costs by $1.6 billion over five years.

The Galvin Task Force saw that energy and environmental R&D at the labs must be more closely integrated. We have strengthened that connection by emphasizing collaborative research among programs. Our Energy Research and Environmental Management programs, for example, are working together to develop advanced biotechnology to lower the multi-billion dollar cost of cleaning up the environmental legacy at our weapons production. The Galvin Task Force also supported our plans for science-based stockpile stewardship and the National Ignition Facility, both of which are part of our national security missions.

The Strategic Alignment Initiative, conducted by our employees, is reshaping the Department so that it may better accomplish its missions and use taxpayer money more wisely. The many recommendations emerging from this effort range from staffing reductions, to office closings and reduction in regulations. These recommendations have resulted in 45 Strategic Alignment Implementations plans, with related savings targets for each year from FY 1998 to FY 2001. The Strategic Alignment Initiative commits the Department to achieving $1.7 billion in savings through operational efficiencies over five years.

Currently, we are ahead of schedule in achieving many of our Strategic Alignment commitments. Since May 1995, we have eliminated 1,300 Federal positions, closed three field offices, and consolidated several programs. Net savings from staffing reductions alone are anticipated to amount to over $50 million in FY 1996. We estimate that FY 1996 savings achieved by reducing support service contracting will amount to $120 million, well ahead of our $90 million target. We also anticipate savings of $40 million from reductions in FY 1996 travel costs. We have streamlined the Code of Federal Regulations by 25 percent. Other projected savings for FY 1996 include $41 million in information management and $6 million through improvements in our National Environmental Policy Act processes. In addition, we have recovered $3.1 million from the sale of Cold War assets.

The Yergin Task Force, in examining the strategic relevance, diversity, and management of the Department's energy R&D portfolio, underscored the importance of our vital work in this area. The Department is currently addressing the Yergin Task Force report recommendations for continued support of energy R&D, related cost reductions, and R&D portfolio management. The report recommended continued Federal support for balanced, diversified energy R&D as critical to the nation's prosperity. Discounting the budgetary effects of various annual adjustments in the multi-year funding of clean coal technology demonstrations, the Administration's budget request contains increases for energy R&D in both FY96 and FY97, particularly in the areas of energy efficiency and renewable energy. At the same time that we are emphasizing increased support for energy research and development, we are achieving reductions in overhead costs. The Department is successfully realizing time and cost savings in the Department's R&D procurement and financial assistance systems, and is in the process of identifying others. Our FY 1996 appropriations for energy R&D represent a significant down payment on the $1.2 billion the

Department has committed to saving from energy R&D budgets over five years.

The Yergin report further recommended that the Department prioritize its energy R&D investments based on their contributions to the Department's missions and strategic criteria. The Task Force recommended that DOE invest in a diverse set of technologies, with a balance between long- and short-term goals, and basic and applied research, with special emphasis on energy efficiency and renewable technologies. I have established an R&D Council, an Energy Resources Board, and an internal task force on portfolio analysis that are working together to implement these recommendations and to improve the management and coordination of DOE energy R&D. The R&D Council, chaired by the Deputy Secretary of Energy, is working to integrate research activities throughout the Department, with the goal of improving the synergy between related programs, leveraging resources, and avoiding duplication. The Department is also participating in interagency science fora to address the Yergin Task Force recommendation that new approaches to financing energy R&D, including a two-year funding cycle, be considered.

As part of our Openness Initiative, I directed Department of Energy personnel to cease routine and non-routine destruction of documents and to identify all pertinent records and information in the Department's possession and in the possession of our laboratories and contractors. We have reduced an extensive backlog of public requests for information. The Department has expedited the identification, retrieval, management, declassification, and dissemination of information regarding human radiation experiments, for example. Over the past two years, DOE has declassified thousands of documents, many of which have contributed to public discussion of complex issues such as the disposition of plutonium and the ethics of early medical experiments that helped to determine the effects of radiation.

ADVISORY COMMITTEE ON EXTERNAL REGULATION

Mr. Myers. What is the Department's current plan to respond to the recommendation of the Advisory Committee on External Regulation?

Secretary O'Leary. The Advisory Committee on External Regulation of DOE Nuclear Safety was formed to provide recommendations for consideration by me and the Administration. As you know, the Committee recently submitted a report, which indicated that the Department's credibility would be improved with an independent outside regulator. The report strongly recommended that, with the end of the Cold War, safety and health at the DOE facilities should be regulated by outside agencies rather than DOE itself. I strongly endorsed the Committee's three major recommendations, which included: (1)under any regulatory scheme, DOE must maintain a strong internal safety management system; (2) essentially all aspects of safety at DOE's nuclear facilities should be externally regulated; and (3) existing agencies rather than a new one should be responsible for external regulation. Subsequent to the issuance of the Committee's report, I established a DOE Working Group to evaluate the Committee's recommendations. I have asked Acting Under Secretary Tom Grumbly to lead this effort because I believe this important issue deserves senior level focus. With senior level leadership the Department has an opportunity to shape a response based on the broad knowledge and expertise within the Department. The Working Group is to submit a report to me by the end of July 1996.

ADVISORY COMMITTEE ON HUMAN RADIATION EXPERIMENTS

Mr. Myers. What recommendations were made by the Independent Presidential Advisory Committee on Human Radiation Experiments?

Secretary O'Leary. The list of recommendations from the Presidential Advisory Committee on Human Radiation Experiments final report has been extracted. I would like to insert these recommendations for the record. The information follows:

CHAPTER 18

RECOMMENDATIONS

Recommendations for Remedies Pertaining to Experiments and Exposures During the Period 1944-1974[*]

Biomedical Experiments

Recommendation 1

The Advisory Committee recommends to the Human Radiation Interagency Working Group that the government deliver a personal, individualized apology and provide financial compensation to the subjects (or their next of kin) of human radiation experiments in which efforts were made by the government to keep information secret from these individuals or their families, or from the public, for the purpose of avoiding embarrassment or potential legal liability, or both, and where this secrecy had the effect of denying individuals the opportunity to pursue potential grievances.

*In preparing these recommendations, the Advisory Committee addressed only the question of whether the federal government owes remedies to subjects or their surviving immediate family members. The remedies identified below are not intended to preclude any remedies that subjects or their family members may otherwise be entitled to from nonfederal institutions or from individuals.

The Advisory Committee has found three cases to which the above applies. These are the surviving family members of:

1. The eighteen subjects of the plutonium injection experiments;

2. The subject of a zirconium injection experiment, known only as Cal-Z; and

3. Several subjects of total-body irradiation experiments conducted during World War II.[1]

Deliberate attempts by public officials in trusted and often sensitive government positions to conceal the fact of participation from subjects or their families, particularly in the absence of sufficient national security justification and for the declared purpose of avoiding potential liability and public embarrassment, are assaults upon the foundations of individual privacy and self-determination. Such actions violate an

individual's right to information about him- or herself and must be taken with the utmost seriousness.

In the cases listed above, this secrecy served to prevent people who may have been wronged from seeking redress within their lifetimes. Secrecy regarding the participation of particular subjects was maintained until as late as 1974. Documents showing that the government kept information secret about particular 1940s experiments on grounds of potential liability and embarrassment remained secret until retrieved by the committee in 1994. Even though at the time justice might not have required financial compensation for the failure to disclose information in the absence of direct physical harm, the fact that the government's actions limited the opportunity of these subjects to seek justice is undeniable. Because of the offensiveness of the government's actions, justice today warrants a remedy of financial compensation.

Moreover, efforts to cover up governmental wrongdoing are assaults upon the polity itself, and not just upon the directly affected individual, because such efforts undermine the ability of a civil society to ensure that the government and its agents act within the rule of law. Such a situation warrants the extension of compensation to the next generation.

Implementation:

Congress may need to consider legislation to provide compensation for the immediate families of the subjects in the plutonium injection experiments whose identities are known. The identities of the subject known as Cal-Z, as well as the subjects in the wartime total-body irradiation experiments, are not now known. Should their identities come to light, they or their families also should be compensated. In addition, should additional cases be identified that satisfy the criteria outlined above, further legislation should be enacted or other steps taken to provide those individuals or their family members with similar compensation.

Recommendation 2

The Advisory Committee recommends to the Human Radiation Interagency Working Group that for subjects of human radiation experiments that did not involve a prospect of direct medical benefit to the subjects, or in which interventions considered to be controversial at the time were presented as conventional or standard practice, and physical injury attributable to the experiment resulted, the government should deliver a personal, individualized apology and provide financial compensation to cover relevant medical expenses and associated harms (pain, suffering, loss of income, disability) to the subjects or their surviving immediate family members.[*]

* The Advisory Committee was convened in response to concerns about human radiation experiments that offered no prospect of medical benefit to human subjects. In our historical analysis, the experiments we investigated either offered no prospect of medical benefit or they involved interventions alleged to be controversial at the time (see Overview to Part II). As a consequence, the Advisory Committee focused its consideration of remedies for subjects of human radiation experiments only on those experiments that fit these descriptions. The Committee makes no recommendations about whether, or under what conditions, remedies are appropriate for subjects of human radiation experiments that were considered at the time to offer a plausible prospect of medical benefit to subjects.

The Advisory Committee has identified several experiments that are candidates for remedies to former subjects under this recommendation; these are described below in the section on implementation.

When the government puts an individual at risk in order to serve some collective national interest, it must take steps to ensure that the rights and interests of the individual are adequately protected. The Advisory Committee presumes, however, based on our understanding of the historical context, that such steps were not uniformly undertaken. As a consequence, it is possible that a citizen who was harmed as a result of participation in nontherapeutic research did not adequately consent to this use of his or her person. That the government did not have a system in place to ensure that individuals were not wronged by their use as research subjects in nontherapeutic research without their adequate consent, when that use resulted in harm, warrants a personal, individualized apology and financial compensation to subjects or to their surviving immediate family members.

Analogous cases exist to support this recommendation. In awarding substantial compensation to victims (or their families) of the CIA's MKULTRA experiments who were killed or suffered other serious harm, Congress and the courts recognized that individuals used for government purpose without direct benefit to the experimental subject and without their consent deserved substantial awards.[2]

Nothing in this recommendation should be taken as having implications for how future policies governing compensation for research injuries should be constructed.

Implementation:

Of the experiments that the Advisory Committee studied in detail, we have identified several that are candidates for remedies under this recommendation. These are as follows: the total-body irradiation (TBI) experiments (should it be determined that TBI was considered at the time to be a controversial treatment for patients with "radioresistant" tumors, and it was not presented as such to potential subjects, and

should a determination of harm attributable to the experiments be made); the testicular irradiation experiments using prisoners as subjects (should a determination of harm attributable to the experiments be made); the uranium injection experiments at Rochester and Boston (should a determination of harm attributable to the experiments be made); and some of the iodine 131 experiments involving children (should a determination of harm attributable to the experiments be made). Because of the scope of the Advisory Committee's charge and our limited tenure, we were not in a position to undertake the individualized and detailed fact-finding required to resolve the uncertainties in each of these cases, including the evaluation of medical and research records of all the patients or subjects involved.

In addition, two experiments that the Committee did not study in detail, the iodine 131 experiment in Alaska and the Vanderbilt radioiron nutrition experiments, are currently in legal proceedings in which claims of harm have been made.

If an appropriate forum such as the courts or a properly constituted review committee determines that subjects were harmed as a consequence of nontherapeutic research, or as a consequence of research in which controversial treatments were presented to patients as conventional or standard therapy, it is the Advisory Committee's view that the government should take steps to ensure that the remedies of apology and financial compensation are awarded.

The question of causation is key to any such determination. The Advisory Committee has heard from many public witnesses regarding the standards of proof and presumptions involved in the administration of existing radiation compensation statutes, which cover atomic bomb testing and uranium mining. In those cases the nature of the exposure for all applicants is relatively uniform and well defined, and the exposures have been the subject of a relatively large amount of study; by contrast, in the case of human radiation experiments, each experiment may present a different set of circumstances. In some cases, as in the administration of iodine 131, there is considerable knowledge of the relation between exposure and subsequent injury. In many other situations, less is known.

A decision should be made about how strict a causal association ought to be required, with a more strict standard making financial compensation available to fewer individuals. Whether the standard for presuming "causation" should be strict or loose is a policy decision that depends on values, not science. The standards/values problem speaks both to what should be done about whether the illness should be treated as experiment-related for purposes of compensation if (1) it is impossible to determine the likely range of association between the exposure and the illness (because the facts about dose or method of exposure are not available); and (2) the likely range of association is broad or the probability of association between the exposure and the illness is low.

To determine reasonable medical expenses, a schedule of projected medical costs appropriate for reimbursement could be created for specific diagnoses, rather than compensating for actual costs incurred. This approach would relieve the burden on the subject or immediate family members to prove actual costs, streamline the process for determining level of compensation, and allow for compensation for costs not yet incurred.

Recommendation 3

The Advisory Committee recommends to the Human Radiation Interagency Working Group that for subjects who were used in experiments for which there was no prospect of medical benefit to them and there is evidence specific to the experiment in which the subjects were involved that (1) no consent, or inadequate consent, was obtained, or (2) their selection as subjects constituted an injustice, or both, the government should offer a personal, individualized apology to each subject.[*]

* For a discussion of the Committee's deliberations about this recommendation, see "Overview to Part IV."

The Committee believes that people who were used as research subjects without their consent were wronged even if they were not harmed. Although it is surely worse, from an ethical standpoint, to have been both harmed and wronged than to have been used as an unwitting subject of experiments and suffered no harm, it is still a moral wrong to use people as a mere means without their consent. Although what we know about the practices of the time suggests it is likely that many people who were subjects in nontherapeutic research were used without their consent or with what today we would consider inadequate consent, in most of these cases we have almost no information about whether or how consent was obtained. Moreover, in most of these cases, the identities of the subjects are not currently known; even if considerable resources were expended, it is likely that most of their identities would remain unknown.

The Committee is not persuaded that, even where the facts are clear and the identities of subjects known, financial compensation is necessarily a fitting remedy when people have been used as subjects without their knowledge or consent but suffered no material harm as a consequence; the remedy that emerged as most fitting was an apology from the government.

The Committee struggled with the issue of whether to recommend that the government extend such an apology. Our deliberations were complicated by what we all agreed was a murky historical record. In the case of some experiments, there was evidence of some disclosure or some attempt to obtain consent, and the issue emerged

as to how poor these attempts must be for an apology still to be in order. In the great majority of cases, there was simply too little documentary evidence to draw any conclusions about disclosure or consent. In most cases, as noted above, the identities of subjects are unknown and are unlikely to be uncovered even with a substantial expenditure of resources.

What kind of evidence is necessary to determine that an apology is warranted? In the preceding recommendation, the remedy is linked to evidence of harm to particular individuals. While requiring evidence of harm specific to individuals, we did not require such specific evidence of lack of consent. Rather, in that recommendation, we presumed that the government did not uniformly undertake steps to ensure that the rights and interests of individual subjects were adequately protected, and thus that it is possible that people who were harmed as a result of participation in research did not adequately consent to this use of their person. In this recommendation, by contrast, a remedy is linked to a showing that people were wronged, not harmed. Thus the Committee believes that an apology should be offered only where there is evidence specific to an experiment or subject that no consent, or inadequate consent, was obtained, or the subject's selection constituted an injustice, or both.

The Committee believes that, among those experiments we have had the opportunity to review in depth, there is sufficient evidence that wrongs were committed against the children who participated in the experiments at the Fernald School. This case is discussed in detail in chapter 7.[*]

In recommending an apology to individuals who were subjects of these experiments, the Committee wishes to emphasize that there are likely many other instances in which an apology is warranted but for which experiment-specific factual support is not currently available.[3]

* Several other experiments studied by the Committee are candidates for remedies under Recommendation 2. Where it is determined that subjects in these experiments were not harmed, they may be due an apology under this recommendation if it is determined that they were wronged.

Recommendation 4

In the research that we reviewed for this recommendation, the Advisory Committee has found no subjects of biomedical experiments for whom there is a need to provide notification and medical follow-up for the purpose of protecting their health. In the event that other experiments of concern come to light in the future, we recommend to the Human Radiation Interagency Working Group that subsequent decisions for notification be based on evaluation of both the level of risk from radiation exposure and the potential medical benefit from medical

follow-up in exposed individuals.

Additionally, the Advisory Committee has found no evidence to indicate that the subjects of human radiation experiments we reviewed would have had greater likelihood of incurring heritable (genetic) effects than the general population and thus does not recommend notification or medical follow-up for descendants of subjects of human radiation experiments.

In formulating this recommendation, the Advisory Committee considered those subjects for whom there is a significant risk of developing a radiation-related disease that has not yet occurred, or has occurred but may still be undetected or untreated, and in whom there might be an opportunity to prevent or minimize potential health risks through detection and treatment. In considering notification, we focused only on biomedical experiments, as stated in our charter.

The Advisory Committee based its present recommendation on the specific guidelines stated below and recommends that future decisions for medical notification and follow-up of subjects of government-sponsored human radiation experiments not examined by the Committee, or that have not yet come to light, be based on these same guidelines, as follows:

1.The subject was placed at increased lifetime risk for development of a fatal radiation-induced malignancy. Thelevel of increased risk was set by the Advisory Committee at 1/1,000 remaining lifetime risk and an excessrelative risk of greater than 10 percent (organ specific). This level of risk was arbitrarily chosen by the AdvisoryCommittee. When compared with the normal risk of dying of cancer (220 out of 1,000), this level of risk is small.The Advisory Committee chose this small remaining lifetime risk as a reasonable initial criterion to decide if ananalysis of the utility of screening and intervention (criterion 2 below) was needed.

2.There is a recognized medical benefit from early detection and treatment of the cancer, which outweighswhatever medical risks are associated with detection and treatment interventions. In addition, the governmentshould consider the public health and financial costs as well as the potential benefits before making a decision tooffer such a notification and screening program.

Eligible subjects for whom medical follow-up to protect health is recommended should be notified of their participation in a human radiation experiment, and voluntary screening programs offered to them. Such a program should include adequate disclosure of both the nature of the potential benefits as well as the potential risks of medical follow-up, which might include some of the following aspects:

medical harm, discomfort, inconvenience, or anxiety from the screening test

itself or subsequent follow-up exams;

the possibility of incorrect test results, either false positive or false negative;

the possibility of stigmatization by friends, family, employers, or life/health insurance carriers;

the costs to themselves of the screening program (if any) and subsequent medical tests and treatments.

Thus the Advisory Committee's recommendations for notification and medical follow-up of individuals who were subjects of a human radiation experiment depend equally on risk estimates and the medical utility of early detection and treatment for changing the course of disease or the quality or length of life in such an exposed individual, as shown in the accompanying table.

The Advisory Committee database includes articles and other documents describing approximately 4,000 government-sponsored human radiation experiments. Because of the limited data available on most of these, and the Advisory Committee's limited resources, it has not been feasible for the Advisory Committee to systematically apply the two criteria described above to the majority of experiments identified within its database. The Advisory Committee therefore selected for review types of experiments that seemed most likely to include subjects who might still be alive and meet the risk criteria chosen by the Committee and who might medically benefit from notification and medical follow-up.

DETERMINATION OF THE NEED FOR NOTIFICATION AND MEDICAL FOLLOW-UPRisk Analysis (For Development of Fatal Cancer)Remaining Lifetime Risk 1/1,000 AND RR 10% Remaining Lifetime Risk < 1/1,000 OR RR< 10% Medical Benefit from Early Detection and Treatment Yes RECOMMEND NOTIFICATION AND MEDICAL FOLLOW-UP NO NOTIFICATIONNo NO NOTIFICATION NO NOTIFICATION

Specifically, the Advisory Committee has reviewed twenty one studies involving three types of experiments:

1.Children who received iodine 131;2.Prisoners subjected to testicular irradiation; and3.Children and military personnel exposed to nasopharyngeal radium treatments.

Following this detailed analysis, the Advisory Committee concluded that none of the experiments examined satisfied both of the guidelines identified in this recommendation. If in the future new methods of screening are developed or new

information about increased risk is discovered, then these experiments should be reevaluated to assess whether they meet the criteria. (For a full discussion, see the addendum on medical notification and follow-up at the end of this chapter.)

Though it was beyond the scope of the Advisory Committee to evaluate individually all the experiments in our database, the results of our review of these carefully selected studies suggest that the remaining experiments would be unlikely to meet the proposed criteria for notification and medical follow- up. However, another important group of studies not considered in detail by the Advisory Committee were tracer studies in pregnant and nursing women.

It is possible that experiments that would satisfy the Committee's criteria for notification and medical follow-up will be identified. Implementation of a notification and medical follow-up program would have to be done carefully if a follow-up program is to provide former research subjects with greater health benefit than harm. Considerable effort would be needed to educate both subjects and physicians about the realistic benefits and the possible harms of medical follow-up, as well as the specific screening modalities and follow-up care that would be indicated. It is particularly important to distinguish follow-up that is intended to benefit medical science from follow-up that is intended to medically benefit patients. An additional concern is that, for most experiments, no list of subjects exists. Performing screening tests in people who are incorrectly identified as having an increased risk is unlikely to result in any benefit and may result in harm.

The Advisory Committee also recognizes that individuals who have received therapeutic radiation treatments, either in a purely clinical setting or research setting, may have been exposed to substantially higher doses of radiation and should seek medical follow-up pursuant to the advice of their treating physician.

With regard to the need to notify descendants of subjects of human radiation experiments of potential genetic effects, it is likely that the risk of radiation- induced mutations is small in relation to natural rates. Thus it would be impossible to distinguish whether the condition was caused by the parent's radiation exposure or by other factors. Based on these considerations, the Advisory Committee does not recommend notification and medical follow- up for descendants of subjects of radiation experiments.

In the event that specific genetic effects attributable to radiation exposure could be identified in a particular population of descendants at some future time, the guidelines would be the same as those previously outlined for subject populations- - there would need to be evidence to indicate that early intervention would change the course of a particular disease before notification and follow- up would be recommended.

Population Exposures

In recent years Congress has enacted a body of laws to provide relief to service personnel exposed to radiation in connection with atmospheric nuclear tests, citizens who lived downwind from the tests, and workers who mined uranium to be used by the government in nuclear weapons production. These include the Veterans Dioxin and Radiation Exposure Compensation Standards Act of 1984, the Radiation-Exposed Veterans Compensation Act of 1988, and the Radiation Exposure Compensation Act of 1990.

In the Committee's view, these existing laws provide the framework on which to base continued provision for relief. In the interim since these laws were passed, experience with the laws and more current scientific knowledge strongly suggest the need for revisiting the laws and their administration and for extending their coverage to similarly situated groups--such as those exposed to intentional releases--who are not now covered.

The following recommendations address the circumstances of groups exposed to intentional releases, service personnel who were exposed in connection with nuclear weapons tests, and workers who mined uranium for use in government programs. We also address the circumstance of the citizens of the Republic of the Marshall Islands, for whom a different framework of remedies has been fashioned.

Recommendation 5

The Advisory Committee recommends to the Human Radiation Interagency Working Group that it, together with Congress, give serious consideration to amending the provisions of the Radiation Exposure Compensation Act of 1990 to encompass other populations environmentally exposed to radiation from government operations in support of the nuclear weapons program, should information become available that shows that areas not covered by the legislation were sufficiently exposed that a cancer burden comparable to that found in populations currently covered by the law may have resulted.

The Advisory Committee did not have the time or resources to undertake our own epidemiologic studies of the cancer burden surrounding the Hanford facility in Washington state, where the Green Run took place. The preliminary radioiodine dose estimates now available raise the issue of whether the releases from Hanford may have caused cancers. The Advisory Committee found that the Green Run itself contributed only a very small portion of that cancer burden, so small that it would be impossible to attribute any cancers to the Green Run as opposed to other sources (including routine Hanford releases). The Advisory Committee believes that in addressing the Green Run intentional release, the appropriate response is to redress injury without regard to

whether exposures were in the course of routine or research activities. There would be no practical way to make this distinction, if it were desired. We also note that the Radiation Exposure Compensation Act provides relief for downwinders and uranium miners without regard for whether they were subjects of research (and in many cases they were not).

Recommendation 6

The Advisory Committee recommends to the Human Radiation Interagency Working Group that it, together with Congress, give serious consideration to reviewing and updating epidemiological tables that are relied upon to determine whether relief is appropriate for veterans who participated in atomic testing so that all cancers or other diseases for which there is a reasonable probability of causation by radiation exposure during active military service are clearly and unequivocally covered by the statutes.

Congress has provided for compensation for veterans who participated in atmospheric atomic tests or the American occupation of Hiroshima or Nagasaki, Japan. The provision of compensation depends on evidence that the veteran has sustained disability from a disease that may be related to radiation exposure.

The Veterans Dioxin and Radiation Exposure Compensation Standards Act of 1984 required the Veterans Administration to write a rule governing entitlement to compensation for radiation-related disabilities. The resulting regulation contains criteria for adjudicating radiation claims, including consideration of a radiation-dose estimate and a determination as to whether it is at least as likely as not that the claimed disease resulted from radiation exposure. The Radiation-Exposed Veterans Compensation Act of 1988 provides that a veteran who was present at a designated event and subsequently develops a designated radiogenic disease may be entitled to benefits without having to prove causation.[4]

The Committee recommends that the radioepidemiological tables prepared by the National Institutes of Health in 1985, which identify diseases that may be causally connected to radiation exposures, be updated. The Committee understands that the Department of Veterans Affairs agrees with this recommendation.

... The Advisory Committee further recommends to the Human Radiation Interagency Working Group that it review whether existing laws governing the compensation of atomic veterans are now administered in ways that best balance allocation of resources between financial compensation to eligible atomic veterans and administrative costs, including the costs and scientific credibility of dose reconstruction.

While the Committee's inquiry focused on participants at atmospheric testing

who were subjects of experimentation, the Committee found that the risks to which experimental subjects were exposed were typically similar to those to which many other test participants were subjected. Those service members who were participants in the experiments reviewed by the Advisory Committee would, as veterans of atmospheric atomic tests, be eligible for relief under the laws enacted in 1984 and 1988, as amended, concerning radiation-exposed veterans.

The Committee found that the government did not create or maintain adequate records regarding the exposures of all participants, the identity and test locale of all participants, and the follow-up, to the extent it took place, of test participants. Witnesses before the Advisory Committee, and others who communicated with us by mail, telephone, and personal visit, expressed strong concerns about the adequacy and operation of the current laws, including, specifically, record-keeping practices. Although the Committee did not have the time or resources to pursue these concerns to the degree they merit, we believe that the concerns expressed by veterans and their family members deserve attention, and we urge the Human Radiation Interagency Working Group in conjunction with Congress to address these concerns promptly. The concerns reported to us include the following:

1.The listing of diseases for which relief is automatically provided--the "presumptive" diseases provided for in the1988 law--is incomplete and inadequate.

2.The standard of proof for those without a presumptive disease is impossible to meet and, given the questionablecondition of the exposure records retained by the government, inappropriate.

3.The statutes are limited and inequitable in their coverage; for example, the inclusion of those exposed atatmospheric tests does not protect those who were exposed to equal amounts of radiation in activities such ascleanup at Enewetak atoll.

4.The time and expense needed to prosecute a claim is too great. For example, veterans whose claims are initiallydenied at the VA regional offices and are seeking appeal of the initial decision receive a form letter stating that itwill take at least twenty-four months to process their appeal.

5.Time and money spent on contractors and consultants in administering the program would be better spent ondirectly aiding veterans and their survivors.

Recommendation 7

The Advisory Committee recommends to the Human Radiation Interagency Working Group that it, together with Congress, give serious consideration to amending the provisions of the Radiation Exposure Compensation Act of 1990

relating to uranium miners in order to provide compensation to all miners who develop lung cancer after some minimal duration of employment underground (such as one year), without requiring a specific level of exposure. The act should also be reviewed to determine whether the documentation standards for compensation should be liberalized.

The uranium miners were exposed to extremely high levels of radon daughters, which were recognized at the time to be hazardous yet were not controlled by the government, despite the availability of feasible means to ventilate the mines. Furthermore, the government studied the miners without disclosing the purposes of the examinations or warning them of the hazards to which they were exposed. As a result of their continued exposure, hundreds of miners developed lung cancer or nonmalignant respiratory diseases that could have been prevented, and many of them have died.

In recognition of this tragedy, Congress included provisions for compensating certain uranium miners in the Radiation Exposure Compensation Act of 1990 (RECA). However, the criteria for compensation set in this act were far more stringent than for the two other groups (atomic veterans and downwinders of the Nevada Test Site) for which compensation was provided, despite the fact that the risks were far higher for the uranium miners.

Since 1990, additional scientific information has become available to support the view that radon exposure is responsible for a much higher proportion of the lung cancer cases among the miners than had been previously thought. In particular, the act's current requirement of a minimum of 200 WLM (working level months) exposure for nonsmokers or 300 to 500 WLM (depending on age) for smokers translates to quite large probabilities of causation, according to a recent report by the National Cancer Institute.[5] That analysis finds little evidence to support a distinction between smokers and nonsmokers and suggests that a majority of lung cancer deaths among Colorado white miners and New Mexico Navajo miners are attributable to radon exposure. Furthermore, it finds that the lung cancer risk is strongly modified by a number of factors and uncertainties that are not accounted for in the total dose; thus, for many miners, the level of exposure that would merit compensation on the basis of the principle of "balance of probabilities" might be far lower than the present criteria. In particular, no exposure measurements are available for 90 percent of the years in most mines, so that any requirement to reconstruct exposure histories is likely to require some degree of extrapolation or estimation and be quite uncertain. Furthermore, many mines have since gone out of business, so that records needed to establish an exposure history are simply unavailable.

Also since 1990, there has been considerable experience with the administration of the act, and apparently much of it has been negative. The Advisory Committee took

extensive testimony regarding the difficulties faced by miners in meeting the documentation requirements, particularly those related to the requirement to provide a reconstruction of their radon dose. For these practical reasons, and in light of the additional information, we suggest that the requirement that a miner demonstrate that he had been exposed to a certain minimum cumulative dose be replaced by a simple requirement that he worked underground for a certain minimum length of time. Since more than half the lung cancer deaths in the cohort who worked at least one month underground appear to be attributable to radon, we suggest that minimum length of service be set quite low, preferably not more than a year. At most this should then lead to compensation being awarded to twice as many miners as would be entitled to it under the balance of probabilities principle, while not denying it to any who are entitled to it.

The grave injustice that the government did to the uranium miners, by failing to take action to control the hazard and by failing to warn the miners of the hazard, should not be compounded by unreasonable barriers to receiving the compensation the miners deserve for the wrongs and harms inflicted upon them as they served their country.

Recommendation 8

The Advisory Committee supports the Department of Energy's program of medical monitoring and treatment for the exposed inhabitants of the Marshall Islands atolls of Rongelap and Utirik and recommends that this program be continued as long as any member of the exposed population remains alive. Furthermore, the Advisory Committee recommends that the program be reviewed to determine if it is appropriate to add to the program the populations of other atolls to the south and east of the blast whose inhabitants may have received exposures sufficient to cause excess thyroid abnormalities. The Advisory Committee also recommends that consideration be given to the involvement of the Marshall Islanders in the design of any further medical research to be conducted upon them and the Advisory Committee recommends that the Human Radiation Interagency Working Group consider establishing an independent panel to review the status and adequacy of the current program of medical monitoring and medical care provided by the United States to the exposed population of the Marshall Islands.

The 1954 Bravo hydrogen bomb test caused the populations of several Marshall Islands atolls to be exposed to hazardous levels of radiation. The United States has provided a medical follow-up program that combines research on radiation effects with treatment for radiation-related illnesses. It is noteworthy that as a result of the ongoing program to study radiation effects, many cases of thyroid disease were detected and treated, but not all exposed Marshallese received the benefits of the program. The people of Ailuk, for example, who according to early reports received about the same

exposure as the people of Utirik, were never evacuated from their atoll and were not followed up medically, even though they received a radiation dose of more than six roentgens. Moreover, an epidemiological study reported in the Journal of the American Medical Association in 1987 demonstrated that inhabitants of several atolls to the east and south of Bikini had elevated levels of thyroid disease and that there was a "strong inverse linear relationship" between incidence of thyroid nodules and distance from the blast. It should also be noted that the exposed populations received additional doses of radiation over the years from later bomb tests and residual radiation on the atolls. The medical program is ongoing, but Congress has the authority to reduce or eliminate funding.

Available evidence indicates that many Marshallese—it is impossible to identify specific individuals—were not adequately informed about the purposes of the medical tests to which they were subjected. There is also evidence in the documentary record that the Marshallese often did not understand the relationship between the research and medical care components of the medical follow-up program. For example, Dr. Robert A. Conard headed the program, and according to his report on twenty years of medical treatment and monitoring, "the people did not always understand the need for the examinations, or their results." Although this situation has improved in recent years, it would nevertheless be appropriate to consult with the Marshallese in the design and implementation of further medical research so as to minimize any possibility of misunderstanding and to ensure that the priorities of the Marshallese are a consideration in the planning of such research.

The Advisory Committee supports the continuation of the Department of Energy's program of medical monitoring and medical care for the exposed inhabitants of the Marshall Islands. Questions have been raised during the course of our deliberations as to whether this program is running as well as it should, both with respect to the research and monitoring activities conducted by Brookhaven National Laboratory (BNL) and with respect to the medical care provided. In particular, the issue has emerged whether the medical care ought to be expanded to include treatment for conditions that are not radiogenic as a further remedy to Marshallese people who were exposed, however inadvertently, as a result of weapons tests. The Advisory Committee did not have the resources to pursue these issues, but we believe that they deserve serious consideration. One mechanism through which this could be accomplished is the establishment of an independent panel to review the program with input from the Marshallese as to the panel's composition.

Recommendations for the Protection of the Rights and Interests of Human Subjects in the Future

While we were constituted to consider issues related to human radiation experiments, in critical (but not all) respects, the government regulations that apply to

human radiation research do not differ from those that govern other kinds of research. In comparison with the practices and policies of the 1940s and 1950s, there have been significant advances in the protection of the rights and interests of human subjects. These advances, initiated primarily in the 1970s and 1980s, culminated in the adoption of the Common Rule throughout the federal government in 1991. Although the Common Rule now affords all human subjects of research funded or conducted by the federal government the same basic regulatory protections, the work of the Advisory Committee suggests that there are serious deficiencies in some parts of the current system. These deficiencies are of a magnitude warranting immediate attention.

The Committee was not able to address the extent to which these deficiencies are a function of inadequacies in the Common Rule, inadequacies in the implementation and oversight of the Common Rule, or inadequacies in the awareness of and commitment to the ethics of human subject research on the part of physician-investigators and other scientists. We urge that in formulating responses to the recommendations that follow, the Human Radiation Interagency Working Group consider each of these factors and subject them to careful review.

Recommendation 9

The Advisory Committee recommends to the Human Radiation Interagency Working Group that efforts be undertaken on a national scale to ensure the centrality of ethics in the conduct of scientists whose research involves human subjects.

A national understanding of the ethical principles underlying research and agreement about their importance is essential to the research enterprise and the advancement of the health of the nation. The historical record makes clear that the rights and interests of research subjects cannot be protected if researchers fail to appreciate sufficiently the moral aspects of human subject research and the value of institutional oversight.

It is not clear to the Advisory Committee that scientists whose research involves human subjects are any more familiar with the Belmont Report[6] today than their colleagues were with the Nuremberg Code forty years ago. The historical record and the results of our contemporary projects indicate that the distinction between the ethics of research and the ethics of clinical medicine was, and is, unclear. It is possible that many of the problems of the past and some of the issues identified in the present stem from this failure to distinguish between the two.

The necessary changes are unlikely to occur solely through the strengthening of federal rules and regulations or the development of harsher penalties. The experience of the Advisory Committee illustrates that rules and regulations are no guarantee of

ethical conduct. The Advisory Committee has also learned, in responses to our query of institutional review board (IRB) chairs, that many of them perceive researchers and administrators as having an insufficient appreciation for the ethical dimensions of research invoiving human subjects and the importance of the work of IRBs. The federal government must work in concert with the biomedical research community to exert leadership that alters the way in which research with human subjects is conceived and conducted so that no one in the scientific community should be able to say "I didn't know" or "nobody told me" about the substance or importance of research ethics.

The Advisory Committee recommends that the Human Radiation Interagency Working Group institute, in conjunction with the biomedical community, a commitment to the centrality of ethics in the conduct of research involving human subjects. We urge that careful consideration be given to the development of effective strategies for achieving this change in the culture of human subjects research, including, specifically, how best to balance policies that mandate the teaching of research ethics with policies that encourage and support private sector initiatives. It may be useful to commission a study or convene an advisory panel charged with developing and perhaps implementing recommendations on how best to approach this challenge for the research community.[7]

The Committee suggests that such an examination include consideration of the following:

Extending to all federal grant recipient institutions and all students and trainees involved or likely to be involved inhuman subject research the current federal requirement that institutions receiving NIH National Research ServiceAward training grants offer programs in the responsible conduct of research. The role of accrediting bodies such as the Joint Commission on Accreditation of Healthcare Organizations(JCAHO). Establishing competency in research ethics as a condition of receipt of federal research grants, both forinstitutions and individual investigators. Incorporating of research ethics, and the differences between the ethics of research involving human subjectsand the ethics of clinical medical care, into curricula for medical students, house staff, and fellows. Encouraging the nation's leaders in biomedical research to spearhead efforts to elevate the importance ofresearch ethics in science.

Recommendation 10

The Advisory Committee recommends to the Human Radiation Interagency Working Group that the IRB component of the federal system for the protection of human subjects be changed in at least the five critical areas described below.

1. Mechanisms for ensuring that IRBs appropriately allocate their time so they

can adequately review studies that pose more than minimal risk to human subjects. This may include the creation of alternative mechanisms for review and approval of minimal-risk studies.

The majority of the Advisory Committee's concerns in its Research Proposal Review Project centered on research that exposed subjects to greater than minimal risk of harm. If human subjects are to be adequately protected, such research must be carefully scrutinized. However, higher risk research is often complex, and careful review is time-consuming and difficult. The Advisory Committee heard from several chairs of IRBs who underscored the difficulties their committees experience in finding the time to adequately review such research. Members of IRBs have only so many hours they can devote to review of proposals. This problem of inadequate time appears to have worsened in recent years. Institutional review boards are required to review research proposals prior to their review for funding by the National Institutes of Health. As the probability that a proposal will be approved for funding has decreased over time, due to increasing competition for limited research monies, the number of proposals being submitted to NIH from many institutions has significantly increased. This has resulted in a substantial increase in the workload of some IRBs, whose members are spending considerable time reviewing proposals that are never implemented. Without guidance from the federal government, and perhaps regulatory relief, IRBs may not have the flexibility necessary to concentrate their efforts where subjects are in greatest need of protection—on the proposals that pose the greatest risks to subjects and that are actually implemented.

2. Mechanisms for ensuring that the information provided to potential subjects (1) clearly distinguishes research from treatment, (2) realistically portrays the likelihood that subjects may benefit medically from their participation and the nature of the potential benefit, and (3) clearly explains the potential for discomfort and pain that may accompany participation in the research.

The Advisory Committee's empirical studies and public testimony suggests that there may be considerable confusion in the minds of many members of the public concerning what is "research" or "experimentation," and what is simply an application of a new technology or even standard medical care. There is reason to worry that participants in research may have unrealistic expectations both about the possibility that they will personally benefit from participation and about the discomfort, pain, and suffering that sometimes accompany some research. This seemed particularly to be the case in Phase I and Phase II drug trials. It is important that in the informed consent process it is clearly communicated to the potential subject, particularly the potential patient-subject, that the primary intent of "research" is to advance medical knowledge and not to advance the welfare of particular subjects. Inadequate and potentially misleading information about potential benefits and harms, and about the trade-offs between enrollment in research and standard or conventional treatment, was one of the

major problems identified by the Advisory Committee in our Research Proposal Review Project.

3. Mechanisms for ensuring that the information provided to potential subjects clearly identifies the federal agency or agencies sponsoring or supporting the research project in whole or in part and all purposes for which the research is being conducted or supported.

A morally complicating factor in several of the human radiation experiments the Advisory Committee has studied is the tendency to disclose to subjects only the medical purpose of the research (if that) and not those purposes of the research that advance interests other than medical science or the sponsorship of agencies other than DHEW/DHHS. For example, in the case of the total-body irradiation experiments, the data gathered from the research had a military purpose quite distinct from questions of cancer therapy. The purpose and funding source may be relevant to a person's decision to participate in human subject research and should be disclosed.

4. Mechanisms for ensuring that the information provided to potential subjects clearly identifies the financial implications of deciding to consent to or refuse participation in research.

Many of the consent forms that the Committee reviewed as part of the Research Proposal Review Project were silent on the subject of financial costs. However, knowing whether being in research costs or saves them money may be necessary for potential subjects to make an informed decision about whether to participate. Potential subjects need to know whether the interventions that are part of the research are free or must be paid for and--if there are any financial costs--what they are, the likelihood that third-party payers will pay for these research-related medical services, and the extent to which the research institution will assist patient-subjects in securing third-party payment or reimbursement.

5. Recognition that if IRBs are to adequately protect the interests of human subjects, they must have the responsibility to determine that the science is of a quality to warrant the imposition of risk or inconvenience on human subjects and, in the case of research that purports to offer a prospect of medical benefit to subjects, to determine that participating in the research affords patient-subjects at least as good an opportunity of securing this medical benefit as would be available to them without participating in research.

In research involving human subjects, good ethics begins with good science. In our Research Proposal Review Project, the Advisory Committee was unable to evaluate the scientific merit of a significant number of proposals based on the documents provided by institutions. We suspect that this occurred in part because there is

ambiguity about the role that IRBs should play with respect to evaluation of scientific merit and, thus, that documents submitted to IRBs may be inadequate in this area. The Advisory Committee also heard dissatisfaction with this ambiguity in our interviews and oral histories of researchers and from chairs of IRBs. If the science is poor, it is unethical to impose even minimal risk or inconvenience on human subjects. Although the fine points of the relative merit of research proposals are best left to study sections and other review mechanisms specially constituted to make such judgments, IRBs must be situated to assure themselves that the science they approve to go forward with human subjects satisfies some minimal threshold of scientific merit. In some cases, the IRB may be the only opportunity for this kind of scientific review.

In our Subject Interview Study interviews with patient-subjects, we confirmed that patient-subjects often base their decisions to participate in research on the belief that physicians, and research institutions generally, would not ask them to enter research projects if becoming a research subject was not in their medical best interests. For these patients, even the most candid, clearly written consent form affords little protection, for both the consent form and the consent process are of little interest to them. For patient-subjects whose decisions to participate in research are based on trust, and not on an assessment of disclosed information, the IRB review is of special importance. It is the only source of protection in the federal system for regulating human research positioned to ensure that their participation in research does not compromise their medical interests. Such a determination, however, often requires more specialized clinical expertise than any one IRB can possess. Federal policy must make it clear that IRBs have the responsibility to make this determination, but it must also allow mechanisms to be devised at the local level that permit this responsibility to be satisfied in an efficient and effective manner.

Recommendation 11

The Advisory Committee recommends to the Human Radiation Interagency Working Group that a mechanism be established to provide for the continuing interpretation and application of ethics rules and principles for the conduct of human subject research in an open and public forum. This mechanism is not provided for in the Common Rule.

Issues in research ethics are no more static than issues in science. Advances in biomedical research bring new twists to old questions in ethics and sometimes raise new questions altogether. No structure is currently in place for interpreting and elaborating the rules of research ethics, a process that is essential if research involving human subjects is to have an ethical framework responsive to changing times. Also, for this framework to be effective, any changes or refinements to it must be debated and adopted in public; otherwise, the framework will fail to have the respect and support of the scientific community and the American people, so necessary to its success.

Three examples of outstanding policy issues in need of public resolution that the Advisory Committee confronted in our work are presented below:

1.Clarification of the meaning of minimal risk in research with healthy children, including, but not limited to,exposure to radiation.2.Regulations to cover the conduct of research with institutionalized children.

3.Guidelines for research with adults of questionable competence. Of particular concern is more-than-minimal-riskresearch that offers adults of questionable competence no prospect of offsetting medical benefit.

Current regulations permit the involvement of children as subjects in research that offers no prospect of medical benefit to participants when the research poses no more than minimal risk. An important question that has come to the Advisory Committee's attention, both in the literature and in our Research Proposal Review Project, is whether research proposing to expose healthy children to tracer doses of radiation constitutes minimal risk. The uncertainty surrounding this issue calls into question the adequacy of the federal regulations, as currently formulated, in providing guidance for this category of research. This is a policy question that ought to be discussed and resolved in a public forum at the national level, not left to the deliberations of individual IRBs.

Current regulations do not provide any special protections for children who are institutionalized unless they are also wards of the state. Thus, researchers and IRBs have no more guidance from the federal government on the ethics of conducting such research than was available at the time of the Fernald and Wrentham experiments, decades ago.

The Advisory Committee also confronted in its Research Proposal Review Project another issue of research policy deserving public debate and resolution in a public forum. This is the issue of whether and under what conditions adults of questionable capacity can be used as subjects in research that puts them at more than minimal risk of harm and from which they cannot realize direct medical benefit. It is important that the nation decide together whether or under what conditions it is ever permissible to use a person toward a valued social end in an activity that puts him or her at risk but from which the person cannot possibly benefit medically.

Recommendation 12

The Advisory Committee recommends to the Human Radiation Interagency Working Group that at least the following four steps be taken to improve existing protections of the rights and interests of military personnel with respect to human subject research.

1. Review of policies and procedures: Policies and procedures governing research involving human subjects should be reviewed to ensure that they (1) clearly state that participation as research subjects by members of the armed services is voluntary and without repercussions for those who choose not to participate; and (2) clearly distinguish those activities that are research and therefore discretionary on the part of members of the armed services from other activities that are obligatory, such as training maneuvers and medical interventions intended to protect the troops.

2. Appreciation of regulations: Education in applicable human subjects regulations should be a component of the training of all officers and investigators who may be involved in decisions regarding research on human subjects. Mechanisms are needed to ensure that officers expected to have command responsibilities and all officers engaged in research, development, testing, and evaluation have an adequate appreciation of the regulations (including DOD regulations and directives, and service regulations) that bear on the conduct of research involving human subjects, including an appreciation of the conditions under which such regulations apply, the role of officers in interpreting such regulations, and how such regulations are to be implemented.

3. Maximizing voluntariness: The service secretaries should consider the situations under which it would be appropriate to make obligatory two practices for maximizing voluntariness that have been employed on an ad hoc basis in some military research: first, that unit officers and senior noncommissioned officers (NCOs) who are not essential as volunteers in the research be excluded from recruitment sessions in which members of units are informed of the opportunity and asked to participate in research by investigators; and second, that an ombudsman not connected in any way with the proposed research be present at all such recruitment sessions to monitor that the voluntariness of participation is adequately stressed and that the information provided about the research is adequate and accurate.

The Advisory Committee recommends consideration of steps 1 through 3 above in light of our examination of history that makes plain how difficult it often is in a military context to distinguish an order from a request for voluntary participation and to distinguish research from training. (These tensions are similar in many respects to tensions in the clinical context between research and treatment.) Although the military has a long tradition of commitment to the use of volunteers in research and has introduced significant advances in the military's system of protection for human subjects since the 1940s and 1950s, without constant attention to these inherent tensions, the potential for confusion and inappropriate practice continues.

The military setting, with its strict hierarchical authority structure and pervasive presence in the lives of its members, poses special problems for ensuring the voluntariness of participation in research activities. Thus, although the DOD has

adopted and implemented the consent requirements of the Common Rule, additional procedural safeguards and educational activities for officers may be warranted to counteract the generalized deference to authority inherent in military culture. Also, because the opportunity to serve the nation as subjects in defense-oriented research projects is closely akin to the demands placed on members of the military in their routine duties, it is desirable to emphasize the distinction between research and course-of-duty risks both in consent procedures and in officer training programs.

The Advisory Committee recognizes that additional procedural requirements in soliciting research volunteers and augmenting already demanding training curricula would have administrative costs and, to a limited extent, would shift organizational priorities. It is the Advisory Committee's understanding that the DOD is preparing to revise its directive implementing the Common Rule and that the Advisory Committee's recommendations with respect to steps 1 through 3 above are a timely contribution to the department's deliberations.

Military personnel are exposed to both short- and long-term risks in the course of training and regular duty activities as well as when they participate in biomedical or behavioral experiments. The demarcation of those activities that are research in contrast with those that constitute routine duty assignments and medical care in the military context is not always easy to discern from the standpoint of the potential subject-member of the military. Indeed, except in medical settings where research studies are regularly performed and military testing sites that conduct weapons, matériel, and performance trials routinely, officers as well as their troops may be uncertain as to whether the status of particular exercises is research or training. Greater clarity in communications to potential subjects about the genuinely voluntary nature of participation in research projects and procedural safeguards in recruiting volunteers could improve their understanding of what they are being asked (rather than required) to do. Likewise, educating officers throughout the military services who may be in a position to solicit volunteers for research studies as to the distinctive rights of research subjects and the particular duties to protect subjects of research from both harm and violations of rights would make the Common Rule protections of subjects more effective.

4. Maintenance of a registry: The secretaries of the Navy and the Air Force should be directed to adopt the policy of the Army, as detailed in Army Regulation 70-25, to maintain a registry of all volunteers in human studies and experiments conducted under research and development programs. Such registries make it easier to confirm participation in research by subjects and facilitates their long-term follow-up.

In analyzing the record of atomic bomb testing, the Advisory Committee has found that military personnel were exposed to radiation and nonradiation risks as participants in experiments that were conducted in conjunction with the tests, and as

participants in other activities connected to the testing. While these activities were not intended to measure biological effects of ionizing radiation, the exposure to radiation risk was incurred without adequate provision for the maintenance of records to document exposures or in order to allow for monitoring and follow-up of those who were exposed. Army regulations now provide for a registry of participants in experiments conducted under the authority of the Army's research and development program. This tool for long-term monitoring and follow-up in the case of exposures to risks unknown at the time of participation should be employed by the other services as well.

Recommendation 13

The Advisory Committee recommends that the Human Radiation Interagency Working Group take steps to improve three elements of the current federal system for the protection of the rights and interests of human subjects--oversight, sanctions, and scope.

1. Oversight mechanisms to examine outcomes and performance. In most federal agencies, current mechanisms of oversight of research involving human subjects are limited to audits for cause and a review of paperwork requirements. These strategies do not provide a sufficient basis for ensuring that the current system is working properly. The adequate protection of human subjects requires that the system be subjected to regular, periodic evaluations that are based on an examination of outcomes and performance and that include the perspective and experiences of subjects of research as well as the research community. The Committee recommends that the Human Radiation Interagency Working Group consider new methods of oversight that focus on outcomes and performance of the system of protection of human subjects. The Committee's Subject Interview Study and Research Proposal Review Project, for example, yielded important and heretofore unavailable information about the current status of human subjects protections that could never be obtained from either an oversight policy that audits only "for cause" or a review that determines only whether paperwork requirements have been satisfied.

We realize that resources available for oversight are limited and that there may be real constraints on what, practically, can be achieved. At the very least, we urge that in the setting of priorities for limited oversight dollars, a premium be placed on methods that permit an examination of what the system is actually producing with respect to the outcome of human subjects protections, in contrast to methods that focus on process.

2. Appropriateness of sanctions for violations of human subjects protections. The Committee recommends that the Human Radiation Interagency Working Group review and evaluate the options available to the government when it is determined that there has been a violation of the Common Rule in the conduct of federally sponsored research involving human subjects. The object of this review is to determine whether

the current structure of sanctions that can be imposed on investigators and grantee institutions is appropriate to the seriousness with which the nation takes violations of the rights and interests of human subjects. This structure includes mechanisms for detecting violations (including issues of oversight discussed above), severity of sanctions, and dissemination of policies on sanctions to investigators and institutions. We are particularly concerned that, even in the absence of research-related injury, there be clear and severe penalties for investigators who use human subjects without their consent. Although at least one state authorizes civil and criminal penalties for failure to obtain a subject's consent,[8] in most jurisdictions civil litigation is unlikely to result in penalties to investigators for failing to obtain consent from subjects if the subjects have not been physically injured. The Committee is aware that the Common Rule provides for sanctions of violations of its provisions, including the withdrawal of multiple project assurances and, with that action, research funding. It is not clear, however, that this system of sanctions functions well; nor is it clear that it adequately addresses the public's concerns that those who abuse the trust of research subjects be dealt with accordingly.

3. Extension of human subjects protections to nonfederally funded research. While some nonfederally funded research is performed voluntarily in accordance with the Common Rule, there is a need to assess the level of research performed outside its requirements and to consider action to ensure that all subjects are afforded the protections it offers. The Committee was charged with reviewing only federally funded research, and we limited our inquiries accordingly. However, we are aware that important areas of research are conducted largely independently of federal funding–for example, some research on reproductive technologies. We recommend that the Human Radiation Interagency Working Group take steps to ensure that all human subjects are adequately protected.

Recommendation 14

The Advisory Committee recommends that the Human Radiation Interagency Working Group review the area of compensation for research injuries of future subjects of federally funded research, particularly reimbursement for medical costs incurred as a result of injuries attributable to a subject's participation in such research, and create a mechanism for the satisfactory resolution of this long-standing social issue.

A system of compensation for research injuries has been contemplated since at least the late 1940s, when the Army debated, but ultimately rejected, suggestions to establish a "uniform" program for compensating prisoner volunteers who were injured during experiments involving malaria and hepatitis. Beginning in the 1970s, a number of government-sponsored ethics panels endorsed the provision of compensation for research injuries, culminating with the President's Commission for the Study of Ethical

Problems in Medicine and Biomedical and Behavioral Research (President's Commission) in 1982. Since then, experts and commentators have continued to support this position.[9]

In our deliberations concerning retrospective remedies for injured research subjects, the Advisory Committee was unable to reference a federal policy or guide for a fair system of compensation of research subjects, as no policy exists even today. So that years from now others do not have to revisit and struggle with this issue, the federal government must take steps now to address the issue of compensation for injured research subjects. These steps should include consideration of the approach recommended by the President's Commission in its report, Compensating for Research Injuries: The Ethical and Legal Implications of Programs to Redress Injured Subjects.[10]

The President's Commission summarized the basic argument for compensation as follows:

Medical and scientific experimentation, even if carefully and cautiously conducted, carries certain inherentdangers. Experimentation has its victims, people who would not have suffered injury and disability were itnot for society's desire for the fruits of research. Society does not have the privilege of asking whether thisprice should be paid; it is being paid. In the absence of a program of compensation of subjects, those whoare injured bear both the physical burdens and the associated financial costs. The question of justice iswhy it should be these persons, rather than others, who are to be expected to absorb the financial, as wellas the unavoidable human costs of the societal research enterprise which benefits everyone.[11]

The Advisory Committee urges not only consideration of a compensation policy for physical injuries attributable to research but also that consideration be given to appropriate remedies for subjects who have suffered dignitary harms, even in the absence of physical injury. Subjects so wronged have little recourse in the current system; litigation in the absence of physical injury is unlikely to provide relief to people who have been used as subjects without their adequate consent. If it is determined that financial compensation is not generally an appropriate remedy in the absence of physical injury, consideration should be given to other remedies that would be fitting.

Recommendations for Balancing National Security Interests and the Rights of the Public

Recommendation 15

15a: The Advisory Committee recommends to the Human Radiation Interagency Working Group the adoption of a federal policy requiring the

informed consent of all human subjects of classified research and that this requirement not be subject to exemption or waiver. In all cases, potential subjects should be informed of the identity of the sponsoring federal agency and that the project involves classified information.

15b: The Advisory Committee recommends to the Human Radiation Interagency Working Group the adoption of a federal policy requiring that classified research involving human subjects be permitted only after the review and approval of an independent panel of appropriate nongovernmental experts and citizen representatives, all with the necessary security clearances. This panel should be charged with determining (1) that the proposed experiment has scientific merit; (2) that risks to subjects are acceptable and that the balance of risk and potential benefit is appropriate; (3) that the disclosure to prospective subjects is sufficiently informational and that the consent solicited from subjects is sufficiently voluntary; and (4) whether potential subjects must have security clearances in order to be sufficiently informed to make a valid consent decision, and if so, how this can be achieved without compromising the privacy and voluntariness of potential subjects. Complete documentation of the panel's deliberations and of the informed consent documents and process should be maintained permanently. These records should be made public as soon as the national security concern justifying secrecy no longer applies.

Although the Advisory Committee believes that the interests of both science and potential subjects are best served when research involving human subjects is conducted in the open, a public policy prohibiting the conduct of human subject research in secret is unwise. Important national security goals may suffer if human subjects research projects making unique and irreplaceable contributions were foreclosed. More citizens may suffer harms for lack of such information than would be harmed if adequately safeguarded human subjects research was conducted in secret.

It also is possible that a prohibition on classified human subjects research would be circumvented through redefinition of activities or disregarded outright. If this were to occur, the participants in such activities could end up less well protected than if they were bona fide research subjects.

The Advisory Committee believes, however, that the classification of human subject research ought properly to be a rare event and that the subjects of such research, as well as the interests of the public in openness in science and in government, deserve special protections. The Advisory Committee does not believe that continuing with the current federal policy governing the protection of human subjects, which does not provide any special safeguards or procedures for classified research, is adequate.

In the current political context, classified human subjects research occurs relatively rarely. Existing policy may prove an inadequate safeguard of individual rights and welfare, however, if in the future national security crises occur that generate a perceived need for classified research. The history of human experimentation conducted in the interests of strengthening and protecting national security that the Advisory Committee has examined demonstrates how the rights and interests of citizens can be violated in secret research. The convergence of elements of secrecy, urgent national purposes, and the essential vulnerability of research subjects, owing to differentials in information and power between those conducting research and those serving as subjects, could again lead to abuses of individual rights and, upon subsequent revelation, the erosion of public distrust in government.

The Advisory Committee is particularly concerned about two aspects of current policy—exceptions to informed consent requirements and the absence of any special review and approval process for human research that is to be classified. The current requirement for the informed consent of research participants is not absolute, leaving open the possibility that subjects may serve as mere tools of the state in the interests of national security if consent is waived. A strengthened requirement for the informed consent of research subjects in classified research should safeguard against the merely instrumental use of individual people to serve national purposes.

Institutional review boards of government agencies are not sufficiently independent of the interests of the organizations of which they are a part to set aside considerations of organizational mission when considering research construed as having the greatest national priority. Thus, determination by an agency IRB that a waiver of informed consent is warranted, or that sufficient information about a study remains in a censored protocol description for a potential subject's review, inadequately protects subjects' interests and rights and does not adequately safeguard the public's trust. By contrast, an independent panel should be less subject to unintended bias than that of an IRB of a federal agency whose mission is to protect and promote national security.

Although the Advisory Committee acknowledges that both the formation of an independent review panel and an absolute informed consent requirement create opportunities for information leaks or security breaches and delays in the progress of urgent research, these disadvantages are surmountable and are more than balanced by the increased vigilance afforded the rights and interests of citizens and the safeguarding of the public's trust in government.

Recommendation 16

The Advisory Committee recommends to the Human Radiation Interagency Working Group that improvements be made in the protections of the public's rights and

interests with respect to intentional releases.

16a. The Advisory Committee recommends to the Human Radiation Interagency Working Group that an independent review panel review any planned or intended environmental releases of substances in cases where the release is proposed to take place in secret or in circumstances where any aspect of the environmental review process required by law is conducted in secret.

In conducting its review, the independent panel should ensure that (I) secrecy is limited to that required for reasons of national security; (2) records will be kept on the nature and purpose of the release, the rationale for not informing the public (including workers and service personnel, as well as affected citizens), and alternative means of gathering data that were considered; (3) actions to mitigate risk were considered and will be taken; and (4) actions will be taken to measure the actual effect of the release on the environment and human health and safety, to the extent that measurements are deemed needed and feasible. The panel should also review the conditions on which any information kept secret should be made public, with a view toward ensuring the release of information as soon as practicable, consistent with any legitimate national security restrictions. The panel should report to Congress periodically on the number and nature of releases it has reviewed.

The Advisory Committee does not conclude that intentional releases can never be conducted in secret. It does conclude that, to the extent that the government proposes to conduct an intentional release that involves elements of secrecy, there must be independent review to ensure that the action is needed, that risk is minimized, and that records will be kept to make sure a proper accounting is made to the public at the earliest date consistent with legitimate national security concerns.

The Advisory Committee found that the government has sponsored numerous intentional environmental releases of radiation for research purposes. In many cases these releases were conducted in secret, without warning to the surrounding populations. While the risks posed by these releases appear to have been relatively small, in many cases little data remain on the precise measure of these risks or on actions taken to minimize risk and to ensure that unknowing citizens did not inadvertently expose themselves to greater risks than necessary. In addition, the Committee found that the risks and concerns posed by intentional releases for research purposes--in terms of both the magnitude of radiation exposure and the consequences of secret keeping--sometimes did not differ qualitatively from those posed by "routine" operational releases of radiation. Most notably, the radiation risk posed by the Green Run, a relatively large intentional release, was a fraction of that posed by radiation released in the normal course of operation of Hanford in the mid-1940s.

This recommendation is intended to apply to all secret releases of substances

into the environment, not merely to substances determined to be hazardous. The Committee believes that the operative concern is secrecy; even if the substance released is entirely harmless, the backdrop of secrecy is sufficient to create a climate of distrust. The Committee did not have the expertise, however, to determine whether so broad a sweep was feasible. At minimum, the Committee recommends that any secret release of a substance that would necessitate an environmental impact statement be required to have a review by an independent panel.

Today, federal environmental laws and rules provide for environmental impact statements, which are subject to review, in instances in which the federal government proposes actions with a substantial effect on the environment. However, the rules also provide that part–or even all–of such reviews may be conducted in secret. In fact, reviews that are secret in whole or part do take place.

The Environmental Protection Agency has the authority and responsibility to oversee all environmental impact reviews, including those conducted in secret. However, the Advisory Committee's inquiries indicate that EPA's role in the review of secret impact statements has been limited. Moreover, the decades of secret keeping regarding intentional releases have created a basis for distrust, particularly among those living in potentially affected communities. Even today, there is little practical means by which the public can know the full extent (whether or not great) of environmental decision making and action that is being kept secret. The location of responsibility for review of these activities in a single panel that is itself accountable and that is independent of agencies that conduct releases should be a means to restoring lost trust.

16b. The Advisory Committee recommends to the Human Radiation Interagency Working Group that an appropriate government agency, currently the Environmental Protection Agency, maintain a program directed at the oversight of classified programs, with suitably cleared personnel. This program should maintain critical records, such as environmental impact statements and environmental permits, permanently. The agencies subject to regulation should ensure the timely consideration of environmental impacts and oversight and the timely provision of all necessary clearances. EPA should provide regular unclassified reports to Congress describing the extent of its activities as well as any significant problems.

The requirements of environmental law apply to activities of the federal government, regardless of whether those activities are classified. However, classification complicates the process of regulatory oversight by the EPA or any other regulatory agency and limits the ability to report to the public and for the public to express its own concerns. Furthermore, secrecy has been used to shield activities that raise public health concerns.

For these reasons, the responsibility for environmental oversight is magnified for secret programs. There is no fundamental barrier to effective oversight—at least some regulators can be given the necessary clearances. However, ensuring timely and effective oversight requires cooperation between the regulated agency and the regulatory agency to establish the necessary oversight procedures. These mechanisms are not fully in place. For example, the EPA office with the statutory responsibility to review environmental impact statements maintains no records of classified environmental impact statements and has not historically had individuals cleared to review the most highly classified defense programs. The EPA office responsible for overseeing federal compliance with environmental regulations has just begun to establish mechanisms for overseeing secret programs.

Recommendations on Openness

Recommendation 17

The Advisory Committee recommends that the Human Radiation Interagency Working Group take steps to ensure the continued application of the lessons learned from the Human Radiation Interagency Working Group's efforts to organize and make accessible to the public, and the government itself, the nation's historical records.

The Committee's experience confirms that with presidential directive and the strong and continued support of a multiagency records search team, substantial amounts of the nation's documentary heritage can be located and retrieved. Through the research process, important lessons were learned about ways in which to improve the accessibility and usefulness of this documentary record to both the public and the government.

We are aware that government resources are stretched thin and may well be diminishing. However, the nation's records are a precious asset that the government created, and holds in trust, for its citizens. This asset, and the commitment made to the public through the enactment of the Freedom of Information Act, is of limited value if the government itself cannot access its records as citizens rightfully expect it should. The Committee's experience confirms that there is an intense public interest in using these records, a public willingness to volunteer time and intelligence needed to help organize and research them, and great opportunity to make them available in ways that will permit citizens to do so.

The Committee recommends that the Human Radiation Interagency Working Group effect the following five steps to increase both government and citizen access to information about the past. The implementation of these steps might best be accomplished by the designation of an individual or entity with responsibility and

appropriate authority for their effectuation.[12]

1. The most important historical collections should be entrusted to the National Archives. The agencies and the National Archives should review the extent to which this is now being done and develop policies to hasten the transfer of agency records to the National Archives.

Federal law basically requires that permanent records be transferred to the National Archives when (1) they are more than thirty years old; or (2) earlier if the originating agency no longer needs to use the records for the purpose for which they were created or in its regular current business, or if agency needs will be satisfied by use of the records at the National Archives.

Nonetheless, many portions of older collections have been appraised as permanently valuable but are not at the National Archives. For example, the Committee found that a great number of AEC headquarters records of substantial interest to the Committee and the public are still held by DOE either at its headquarters or at the Washington National Records Center (these include the only collection of general manager files, the post-1958 Executive Secretariat files, virtually all the Division of Military Application files, and most of the files of the Division of Biology and Medicine). In the case of the Department of Defense, the records of the Office of the Secretary of Defense largely remain at the Washington National Records Center or with the Office of the Secretary of Defense.[13]

The public's ability to access records held by agencies is limited because (1) most agencies do not know in detail what records they still hold, and even if folder listings exist, they are not publicly available for the most part; (2) there has generally been little declassification review of these records; (3) there is no requirement that agencies permit access to even completely unclassified or declassified collections; and (4) most agencies have very limited facilities to accommodate researchers. The public's ability to gain access to documents in federal records centers is also limited because (1) the task of examining the basic inventory forms (SF-135s)[14] to determine what is in a record group is time-consuming, and in many cases, the SF-135s do not adequately describe the records; (2) there has generally been very little declassification review of these records; and (3) permission must be obtained from the appropriate agencies to review even completely unclassified or declassified collections; this permission process can be time-consuming and agencies can impose restrictions, such as permitting review but not copying.

Locating records at the National Archives has the following advantages: (1) there is generally at least some type of finding aid and, in some cases, folder listings prepared by the National Archives or the agencies when the records were sent; (2) archivists are available to assist researchers; (3) there is complete access to

unclassified and declassified collections (unless Privacy Act or similar restrictions apply); and (4) many classified records at the National Archives (among the exceptions are Restricted Data records and records dealing with intelligence) are properly the subject of an informal and usually very quick in-house declassification review process called Special Declassification Review. Under Special Declassification Review, records are often reviewed within months, versus the years it takes under the Freedom of Information Act or Mandatory Declassification Review.

2. Agencies should make readily available all existing inventories, indices, folder listings, and other finding aids to record collections now under agency control. Classified finding aids should undergo declassification review, and declassified versions of these finding aids should also be made available.

Finding aids or indices to federal government records holdings are an invaluable tool, without which it would be practically impossible to locate documents of interest from among the hundreds of thousands of boxes of records maintained by the government.

Many collections of records still held by agencies have finding aids or indices that have been inaccessible to the public, either because they simply have never been made available or because they are classified. Finding aids should be made available to the public in a headquarters office, regional offices (including all field site reading rooms), and ultimately, on the Internet. (This recommendation does not call for the creation of indices where they do not currently exist.)

For example, folder listings (which provide the titles of records files) exist for many of the AEC headquarters record collections that are still at DOE or at the Washington National Records Center. These include, among others, the only known collection of general manager's files from 1947 through 1974, all of the Division of Military Applications files from 1947 through 1974, all of the Executive Secretariat files from 1959 through 1974, and most of the Division of Biology and Medicine files from 1947 through 1974. Without the folder listings it would have been difficult for the Advisory Committee to locate particular collections of interest and, even if located, to determine the documents to be reviewed. The folder listings, however, have not been generally available to the public.

Similarly, the DOE's Oak Ridge Operations Office vault contains more than 7,000 cubic feet of classified records. The Committee found that the Records Holding Task Group (RHTG) collection in this vault (about 300 cubic feet) contained many documents of interest to the Committee, which were typically readily declassifiable. This collection has an index; however, the index is classified.

In the case of the National Archives, finding aids are generally available.

However, there are fifteen National Archives facilities around the country. Currently, the only means of determining exactly what records are at a particular branch is to contact that branch directly. This is a time-consuming process, and there are understandable limits on the number of pages of finding aids archivists can copy and send to any person (a single finding aid can total hundreds of pages). It would be much simpler and easier for the public to be able to review the finding aids from all fifteen branches at any one of them.

3. The Human Radiation Interagency Working Group should ensure the development of policies to improve public access to records held by agencies or deposited in federal records centers.

In the case of a vast amount of records, particularly those not yet transferred to the National Archives, the available descriptions are often too broad or incomplete to provide meaningful clues to the contents of boxes. Thus, a Freedom of Information Act request that seeks all information on a given topic may well receive a response that ignores information located in boxes or files that are not clearly labeled or indexed. Under these circumstances, searches may be more fruitfully conducted by citizens with an interest in, and understanding of, the subject of the search. However, because so many of the nation's records collections are off-limits to the public, even citizens who are willing to help are often precluded from lending a hand.

Many collections of interest to citizens contain no classified documents and can be made directly accessible to them. However, the Committee reviewed collections, particularly those containing decades-old records, where the entire collection was classified because it housed a small number of classified documents. For example, Record Group 326 at the College Park National Archives has approximately 160 feet of Metallurgical Laboratory/Argonne National Laboratory documentation that should be of significant historical interest. The collection itself is classified and currently inaccessible to citizens. The Committee's examination of large portions of the collection found very few classified documents, and when found, these documents were immediately declassified.

Executive Order 12958, issued by President Clinton on April 17, 1995 ("Classified National Security Information"), provides broadly for the automatic declassification (with specific exceptions) of all records that are more than twenty-five years old. In implementing the order, agencies should target collections that can be relatively quickly reviewed and made available to the public in their entirety.

4. Agencies should maintain complete records, available to the public, of document destruction.

Government records management rules provide for the destruction at varying

dates in the future of all records that are appraised as temporary (that is, nonpermanent). They also provide that records be kept where certain collections, including classified records, are destroyed. But the Committee found that records of destruction are themselves routinely destroyed.

For example, upon Committee inquiry, DOE investigation revealed that the files of the AEC's Intelligence Division had been substantially destroyed during the 1970s and as late as 1989. (These files may have contained data on intentional releases, experimentation performed by the AEC for other agencies, and on the rules and practices of secret keeping regarding human data gathering). The DOE's inquiry found individuals who stated that they destroyed substantial records and that records of destruction were made. However, in accordance with DOE rules, the "certificates of destruction" were themselves later destroyed.[15] As another example, documents provided by the Department of Veterans Affairs and the Department of Defense indicate that, in 1947, the government contemplated the keeping of secret records in anticipation of potential liability claims from service personnel exposed to radiation and that some such records were kept. However, despite substantial search efforts by the DOD and the VA, the specific identity of the records referred to has not yet been determined.[16]

The Committee presumes that the vast majority of these records were destroyed in the routine course of business. Nonetheless, where records recording the destruction of important collections of records are themselves destroyed, the public cannot know whether important records have been destroyed (or merely are lost) and cannot be easily assured that destruction was in the routine course of business.

5. The Human Radiation Interagency Working Group should review and develop policies concerning public access to records generated or held by private contractors and institutions receiving federal funding.

Since World War II, the government has relied on contractors and grantees to perform an increasing number of governmental activities, including government-sponsored biomedical research. When the Advisory Committee undertook to locate information on particular government-sponsored radiation experiments, it was often told by federal agencies that, if such information was created, it would have been maintained only by nonfederal entities or investigators and not the government itself.

Where an activity is conducted by government employees (for example, researchers working in the facilities of the National Institutes of Health's Clinical Center), citizens have a right to seek access to information relating to that activity, under the Freedom of Information Act. A similar right of access often does not apply, however, where a similar or even identical activity is conducted, also on federal funds, at nonfederal facilities.[17]

From the citizen's vantage point, the right to know about a government-funded activity should not depend on whether that activity is conducted directly by the government or by a government-funded private institution. At the same time, nonfederal institutions are not governmental agencies, and there may be good reasons they should not be burdened with identical obligations to retain records and to provide information to the public.

Rules are needed that accommodate both the citizen's right to know about the conduct of the government and the relevant differences between nonfederal and federal institutions with respect to duties to create and maintain publicly accessible records.[18] To ensure consistent and informed governmentwide treatment of the question, the Human Radiation Interagency Working Group may wish to call on the Office of Management and Budget (OMB) and the Office of Federal Procurement Policy (OFPP) to review the current right of members of the public to gain access to the records of government grantees and contractors.

Recommendation 18

18a: The Advisory Committee recommends to the Human Radiation Interagency Working Group that the CIA's record-keeping system be reviewed to ensure that records maintained by that agency are accessible upon legitimate request from the public or governmental sources. This review could be performed by the CIA inspector general or an oversight panel.

18b: The Advisory Committee recommends that all records of the CIA bearing on programs of secret human research, such as MKULTRA and the related CIA human behavior projects from the late 1940s through the early 1970s, including Bluebird, Artichoke, MKSEARCH, MKDELTA, Naomi, Chance, Often, and Chickwit, become a top priority for declassification review with the expectation that most, if not all, of these documents can be declassified and made available to the public.

These recommendations are intended to ensure that the public and the government have practical access to historical records of the CIA (where access is otherwise appropriate) and to address long-standing public interest and concerns regarding secret human experiments conducted or sponsored by the CIA.

The framework of the records collections of all the Human Radiation Interagency Working Group agencies, save the CIA, is visible to the public. This is the case even in agencies, such as the Defense Nuclear Agency, where historical research records are largely classified.

While documents showing CIA participation in midcentury DOD-sponsored

discussions of human experimentation were obtained from DOD, DOE, and the public National Archives, the CIA was not able to locate such documents in its own files and states that the CIA's role in these discussions was sufficiently minor that such records would not have been kept. The Advisory Committee also notes the recent report to the attorney general of the BNL Task Force, which was investigating a bank-related scandal: "While we benefited from extensive cooperation and assistance from the CIA's Office of General Counsel, the CIA's ability to retrieve information is limited. Records are 'compartmentalized' to prevent unauthorized disclosure; only some of those records are retrievable through computer databases; no database encompasses all records; and not all information is recorded. In the course of our work, we learned of 'sensitive' components of information not normally retrievable and of specialized offices that previously were unknown to the CIA personnel assisting us."[19]

In addition, while the Advisory Committee has found no evidence to show that the CIA conducted or sponsored human radiation experiments, numerous documents, some of which remain partially classified, make reference to possible CIA interest in this area. Although Advisory Committee staff has reviewed all of the available classified information concerning human radiation experiments and requested that it be declassified, the public does not as yet have the benefit of such access.

Twenty years after they were first revealed to the public, there continues to be a strong public interest in the CIA's "mind control" programs. The Advisory Committee received numerous queries about MKULTRA and the other related programs from scholars, journalists, and citizens who have been unable to review the complete record. Although these CIA projects were the subject of significant governmental inquiry in the mid to late 1970s--by the Senate and House committees and by the presidentially appointed Rockefeller Commission--and a substantial portion of the records have been declassified and released to the public, a number of documents remain classified, and many of the documents that have been released contain numerous redactions. This has made it extremely difficult to understand the full context of the activities or to clarify discrepancies or uncertainties in the record.

A number of the declassified documents make reference to radiation experiments. However, because of the redactions, it is impossible for the public to determine from these documents whether there is additional, secret information about radiation activities. (Advisory Committee staff have reviewed the full text of these documents.) For example, the 1963 CIA inspector general report on the inspection of MKULTRA, which was declassified in redacted form in 1975, stated that "radiation" was one of the avenues explored under MKULTRA. But because so much of that document was redacted, the public reader might reasonably suspect that there is more information about radiation in the report. At the request of the Advisory Committee, the CIA re-released this document, and a handful of others, with minimal redactions.

However, few other such documents have been re-reviewed for declassification in almost twenty years. Since most of the classified CIA documents concerning MKULTRA and related programs that Advisory Committee staff reviewed were declassified upon request, the Advisory Committee believes that if the rest of these records were reviewed for historical declassification, most, if not all, of the records could be declassified without harming the national security.

So long as documents about secret human experiments are withheld from the public, it will be impossible to put to rest distrust with the conduct of government. The rapid, public release of the remaining documents about MKULTRA and other secret programs would be a fitting close to an unhappy chapter in the nation's history.

ADDENDUM TO RECOMMENDATION 4: MEDICALNOTIFICATION AND FOLLOW-UP

The Advisory Committee's charter requires that we consider the issue of notice to experimental subjects of potential health risk and the need for medical follow-up:

If required to protect the health of individuals who were subjects of a human radiation experiment, or theirdescendants, the Advisory Committee may recommend to the Human Radiation Interagency WorkingGroup that an agency notify particular subjects of an experiment, or their descendants, of any potentialhealth risk or the need for medical follow-up [Sec. 4.c.].

The basic intent of this provision is not directed at subjects who have already died, or at subjects who have already become ill and been treated. It is primarily aimed at asymptomatic subjects who remain at significant risk for the development of radiation-induced cancers. Because at least two and as many as five decades have passed since the experiments took place, most of those who may eventually develop cancer as a result of the experiment will already have developed symptoms and sought treatment. However, some subjects may still be at risk and thus arguably might benefit from medical follow-up.

The initial consideration in deciding whether to implement a program of active notification and medical follow-up is the identification of populations of subjects who have been put at significant risk for the development of radiogenic cancers. The magnitude and focus of these risk estimates are driven by the specific organs placed at highest risk from the particular radiation exposure (for example, thyroid being the organ at greatest risk in the iodine 131 experiments, testes in the Oregon and Washington prisoner experiments, and the brain for the nasopharyngeal radium experiments). Risk estimates are calculated for each target organ according to a number of assumptions that may include adjustments for variables such as age at exposure, sex, or type of radiation (isotope vs. external beam) and are generally expressed in terms of excess

cancer incidence/mortality for a given population over a specified period at a specified dose.

The Advisory Committee adopted an excess site-specific cancer mortality (death) greater than 1 case in 1,000 (lifetime) as a criterion for determining that a subject had been placed at increased risk. However, because of the substantial passage of time since the initial exposure, the criteria for consideration of active notification were set at 1/1,000 future or remaining lifetime risk and an excess relative risk of greater than 10 percent (organ specific). This level of risk was arbitrarily chosen by the Advisory Committee. When compared with the normal risk of developing cancer (220 out of 1,000), this level of risk is small. The Advisory Committee chose this small remaining lifetime risk as a reasonable initial criterion to decide if a more in-depth analysis of the effectiveness of screening and intervention was needed.

Once a population has been determined to have an increased remaining lifetime risk for radiogenic cancer mortality, a second criterion must be satisfied before a government-funded medical follow-up program is recommended, namely whether the exposed individuals would likely benefit from a program of early detection or early treatment of the malignancy. Effective screening procedures for the detection of an early-stage cancer exist only for a limited number of cancer sites. Moreover, the lack of specificity of all diagnostic screening tests results in a significant number of "false positives" (a positive test result in an individual who in truth is not affected), resulting in unnecessary and potentially hazardous medical procedures that may cause health problems in and of themselves. On the other hand, most diagnostic tests are also imperfectly sensitive, meaning that some individuals who actually have the disease will be falsely reassured that they are cancer free and may thereby delay seeking attention when it becomes symptomatic. To this end the Advisory Committee has adopted the following criteria for assessing the value of screening, preventive, or therapeutic measures for exposed subjects of biomedical experiments:[20]

1. The condition must have a significant effect on the quality or length of life.

2. The condition must have an asymptomatic period during which it can be detected by available screeningmethods.

3. These screening methods must have high sensitivity and specificity.

4. Treatment in the asymptomatic phase must yield a therapeutic result superior to that obtained by delayingtreatment until symptoms appear.

5. The medical benefits of screening and early treatment must outweigh any detrimental medical effects or risks.

These criteria were applied to each exposed population at significant risk for development of a malignancy and evaluated according to the organ(s) at risk from radiation exposure. In each case, the conditions enumerated above must be satisfied before specific medical follow-up would be recommended.

Details of the Advisory Committee's risk calculations can be found in chapters 7 and 9. To summarize, the Advisory Committee found no experiments involving iodine 131 administration to children that met our 1/1,000 criterion for remaining lifetime risk of dying of cancer; even in the most highly exposed individuals, risks were estimated to be 1/2,000 (remaining lifetime risk). In addition, the U.S. Preventive Services (USPS) Task Force concluded that "routine screening for thyroid disorders is otherwise not warranted in asymptomatic adults or children." Although it has been suggested that people placed at risk for development of thyroid carcinoma following high-dose external irradiation to the upper body may benefit from regular physical examination of the thyroid, there are no data to support a similar risk or benefit for those who have been exposed to diagnostic or therapeutic doses of iodine 131.[21]

The Advisory Committee recognizes that in addition to the very small risk of a fatal thyroid cancer, individuals exposed as children to iodine 131 also have a larger risk of a nonfatal thyroid cancer or benign tumor, a lifetime risk that in many of the experiments we considered exceeded 1/1,000 and in a few individuals exceeded 1/100. We recognize that such conditions may require medical treatment and may be associated with considerable anxiety and discomfort. After considerable discussion, however, the Committee concluded that notification was not warranted for the purpose of detecting such conditions early, on several grounds. First, the prognosis for such conditions under standard clinical care is excellent, and there is no evidence that early detection improves the outcome. Second, even among the subgroup of about 200 children exposed to this level of risk, the number of excess cancers expected is less than one, whereas the normal prevalence in an unexposed population is about 20 to 30 percent. Third, many thyroid cancers that are detectable by screening may have no clinical significance. Finally, the most effective means of screening for thyroid cancer remains palpation, which has low sensitivity and low specificity.

For the prisoners subjected to testicular irradiation, the Advisory Committee estimates that even the most heavily exposed individual (600 rad to the testicles) would have a risk of only 0.4/1,000[22] of developing a fatal cancer, which does not attain our stated criterion. Furthermore, the USPS Task Force has concluded that "there is insufficient evidence of clinical benefit or harm to recommend for or against routine screening of asymptomatic men [other than those with a history of cryptorchidism, orchiopexy, or testicular atrophy] for testicular cancer."[23] These considerations lead the Advisory Committee to recommend against any program of active notification of these subjects. However, subjects who voluntarily request medical check-up or counseling should have such provided in a standard clinical setting.

For the children who received nasopharyngeal radium treatments, the Advisory Committee has estimated that the lifetime risk of tumors to the central nervous system (brain), head, and neck regions is approximately 4.35/1,000 and the excess relative risk is about 62 percent, both with considerable uncertainties.[24] Although these experiments were conducted in the 1940s and much of the risk has probably already been expressed, it is still possible that the future risk is greater than or equal to our arbitrary 1/1,000 risk criterion. However, at greatest risk are the brain, and head and neck tissues, for which there is neither an accepted nor recommended screening procedure.[25] Thus, while the subjects in these experiments meet the Advisory Committee's arbitrary 1/1,000 criterion for consideration for notification and medical follow-up (criterion 1 in Recommendation 4, above), the utility of such a program has not been demonstrated, so criterion 2 of Recommendation 4 is not satisfied. Adult military personnel who participated in trials of this procedure received significantly lower radiation exposures, did not attain our arbitrary 1/1,000 criterion for risk, and would similarly fail to meet the criteria in guideline 2. Therefore, the Advisory Committee does not recommend notification and medical follow-up of children or adults in this group of experiments.

The Advisory Committee's charter also requires that we consider the need for notification of descendants of experimental subjects for purposes of health protection. The rationale for considering notification in this instance derived from the assumption that the offspring of former subjects might be at risk for disease or disability as a consequence of inherited mutations resulting from their parent's previous radiation exposure. The weight of evidence suggests that the risk of heritable genetic effects from the radiation exposures in the experiments we reviewed is very small, although it is possible that some offspring of exposed individuals might carry mutations that were caused by radiation.[26] Moreover, in most medical experiments involving external sources of radiation, efforts are made to shield the gonads (ovaries/testes) as much as possible. With the exception of the testicular irradiation experiments, where subjects agreed to undergo vasectomy to prevent transmission of any mutations that might have occurred, experiments involving external irradiation are likely to have produced relatively small gonadal doses, as would those experiments involving tracers. Even therapeutic studies involving internal radionuclides would generally involve only modest gonadal doses. Thus, in the vast majority of experiments, it is likely that the risk of radiation-induced mutations is small in relation to natural rates.

In addition to cancer and genetic effects, there are only a small number of well-established effects of radiation, including severe mental retardation among those exposed in utero (particularly between eight and fifteen weeks of gestation), sterility, cataracts, and hypothyroidism. Unlike cancer and genetic effects, however, these other endpoints appear to be "deterministic" effects that appear only after high doses that are unlikely to have been received by subjects in the experiments under consideration for notification. The Advisory Committee heard extensive public testimony about a range of

other conditions that those testifying thought might be related to radiation exposures. However, the Advisory Committee believes that a program of active notification must be grounded on currently accepted scientific evidence concerning the conditions that are likely to be caused by radiation.

STATUS OF RECOMMENDATIONS

Mr. Myers. What is the status of these recommendations?

Secretary O'Leary. The Interagency Working Group staff has developed a preliminary draft response to the Committee's recommendations. I would like to insert this draft response for the record. Additionally, for the record, I would like to insert a copy of the testimony of Dr. Tara O'Toole, Assistant Secretary for Environment, Safety and Health, on March 12, 1996, before the Senate Committee on Governmental Affairs concerning Human Radiation Experiments. This testimony provides general background about the Department of Energy and Interagency Activities in response to the Presidential Advisory Committee on Human Radiation Experiments, and new initiatives under consideration. The information follows:

INTERAGENCY WORKING GROUP STAFF PRELIMINARY DRAFT RESPONSE TO THE RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON HUMAN RADIATION EXPERIMENTS

BACKGROUND

The Advisory Committee on Human Radiation Experiments (ACHRE), chaired by bioethicist Dr. Ruth Faden of Johns Hopkins University, was established by President Clinton in January, 1994. Acting in cooperation with Federal agencies, which were directed by the President to search for records related to human radiation research and provide them to the Advisory Committee, the Committee was charged to provide expert advice to the Cabinet-level Interagency Working Group (IAWG) on scientific and ethical issues related to biomedical experiments involving ionizing radiation and to a list of intentional environmental releases of radiation. The Committee was to focus on the period 1944-1974 (when government-wide regulations on human subjects research were adopted) but was permitted to go beyond.

FINAL REPORT OF THE ADVISORY COMMITTEE

The Committee's report began by identifying the ethical standards that applied to the government and to the medical and research professions in the post-war period. Several "case studies" were then reviewed in detail, including the injections of plutonium into 18 hospital patients during World War II, research with prisoners, and research funded by the military on patients who had previously been exposed to total body irradiation in clinical settings. Intentional environment releases of radioactivity were also reviewed.

The Committee also considered issues related to some radiation exposures associated with government activities that are not experiments; that is, persons were not exposed for the purpose of research. These include atomic veterans, uranium miners, and residents of the Marshall Islands exposed to fallout from U.S. weapons testing.

Finally, the Committee reviewed 125 current or recent Federally-funded studies (not limited to radiation research) and interviewed patients at selected hospitals in order to gauge the adequacy of procedures for obtaining informed consent from subjects and evaluating research risks and to sample attitudes toward human subject research.

The Advisory Committee's recommendations fall into three major areas: biomedical experiments and population exposures (1944-1974); current human subject protection; and secrecy and openness.

BIOMEDICAL EXPERIMENTS AND POPULATION EXPOSURES

Recommendation 1: Apology and compensation for three specific experiments where secrecy was involved and thus, individuals were denied the opportunity to pursue alleged grievances. These experiments involved Department of Energy (DOE) predecessor agencies and contractors only.

Recommendation 2: Apology and compensation where harm can be established, and where there was no prospect of direct medical benefit to the subject of the experiment. Several experiments and categories of experiments were proposed as candidates by the Committee.

Summary Response: The affected agencies, in coordination with the Department of Justice, are engaged in ongoing discussions with numerous claimant representatives concerning compensation issues.

Recommendation 3: Apology (without compensation) for experiments in which subjects were wronged but not harmed, i.e. where no consent or inadequate consent was obtained or the selection of the subjects constituted an injustice. One experiment was proposed as a candidate with the indication that there may be many others.

Summary Response: At the ceremony in which Dr. Faden presented him the report, President Clinton formally apologized on behalf of the government to the victims of human radiation experiments.

Recommendation 4: No need for subject notification and medical follow-up with criteria for subsequent notification if new experiments come to light.

Summary Response: The IAWG staff agrees with the Advisory Committee that no further response is warranted at this time and that the criteria set forth by the Committee is appropriate for evaluating future cases. The IAWG staff recognizes that this recommendation has generated a great deal of controversy among stakeholders and is soliciting stakeholder input.

Recommendation 5: Working with Congress to amend the Radiation Exposure Compensation Act of 1990 (RECA) to cover other exposed populations including Hanford.

Summary Response: The IAWG staff agrees with the Advisory Committee's concern about treating exposed populations fairly. Studies are underway that look at communities near the Hanford nuclear facility and at other sites including Fernald, Savannah River, Rocky Flats, and Oak Ridge. If information is forthcoming showing increased cancer resulting from the operation of DOE facilities, the government will work with Congress to amend existing laws to cover those affected.

Recommendation 6: Updating the epidemiologic tables that govern relief for veterans and improving the administration of the current laws governing compensation.

Summary Response: The Department of Veterans Affairs (VA) is establishing a Task Force led by the Undersecretary for Benefits to evaluate the likelihood of injury due to exposure to ionizing radiation. Representatives will be included from the Department of Defense (DOD) and the Department of Health and Human Services (HHS). The Task Force will also evaluate the efficacy of the current law and regulations relating to compensation of veterans whose illnesses or deaths may be attributable to their radiation exposures while in military service. The report is expected to be completed in the late spring of 1996. Specifically, the report will recommend the most feasible way to accomplish updating the epidemiologic tables; describe the administration of laws governing compensation of Atomic Veterans; and if appropriate recommend

legislative and administrative changes that address the concerns identified by the Advisory Committee.

Recommendation 7: Working with Congress to possibly amend the Radiation Exposure Compensation Act of 1990 (RECA) relating to uranium miners. The changes would involve a widening of eligibility for compensation and a loosening of documentation requirements.

Summary Response: A committee of government scientists and attorneys with appropriate experience and expertise has been established to review the provisions in RECA that relate to compensation for uranium miners. The committee will also review DOJ's implementing regulations under RECA to ensure that they are not unduly restrictive. The committee consists of four scientists from the National Institute of Occupational Safety and Health (NIOSH) and the National Cancer Institute (NCI), and three attorneys from DOJ. The committee has held several meetings and anticipates submitting a report in late April 1996.

Recommendation 8: Continuing the current medical monitoring and treatment program for citizens of the Marshall Islands as long as any member of the exposed population remains alive. In addition, consideration should be given to adding the populations of other exposed atolls to the south and east; to involving the Marshall Islanders in the design of any further medical research conducted on them; and establishing an independent panel to review the adequacy of the current monitoring and treatment program.

Summary Response: Extensive analyses to date of radiation exposures in the Marshal Islands have indicated that the exposures to inhabitants of Ailuk and other northern Marshall Island atolls were a factor of 30-90 times less than at Rongelap and about 10-25 percent of those at Utirik based upon external dose measurements and on estimates of thyroid doses. The connection between radiation exposure and thyroid disease is the subject of several ongoing studies sponsored by DOE and managed by the Centers for Disease Control (CDC). If new data is developed to indicate that residents of atolls south and east of Bikini

other than Rongelap and Utirik are at increased health risk, the U.S. Congress would need to consider expanding the current medical surveillance program.

The planned Joint Commission for Accreditation of Healthcare Organizations (JCAHO) review of the DOE Marshall Islands Program, administered by the Brookhaven National Laboratory, has recently been suspended. At the request of the Government of the Republic of the Marshall Islands (RMI), the mechanism for such a review is being reevaluated based on further input from RMI. Discussions with the RMI Ambassador to the United States are currently being planned. RMI has requested a broader review that might be done by the National Research Council/National Academy of Sciences. The Department is considering the use of a Blue Ribbon Panel as another possible mechanism for this review.

CURRENT HUMAN SUBJECT PROTECTION

Overview: Responses to these recommendations involve a wide range of approaches, some of which are activities internal to the agencies and others which call upon external resources for implementation.

Among the responses are activities that are being implemented in the near term while others will require preliminary groundwork prior to full implementation. A third group of responses involve referring certain recommendations to the National Bioethics Advisory Commission (NBAC), an independent body established by the President through Executive Order 12975. (Presidential appointments to NBAC are pending.)

In general, agency activities in response to these recommendations fall into the following categories:

- Remanding specific Advisory Committee recommendations to NBAC which will provide expert advice on issues of bioethics;

- Developing educational programs in concert with external groups such as medical schools, universities, scientific societies, and others

to strengthen activities in human subjects protection, to provide a forum for addressing ongoing as well as emerging issues in human subjects research, and to familiarize professionals engaged in no-Federally funded research with the ethical considerations in conducting research involving human subjects;

- Implementing training programs within Federal agencies to educate senior level officials on regulations and policies governing human subjects research;

- Reminding institutions conducting Federally funded research of their ongoing responsibilities with respect to Institutional Review Board (IRB) review;

- Pooling resources across agencies to conduct pilot projects to improve the efficiency and effectiveness of IRB review and to evaluate the government's system for the protection of human subject, and to establish processes for oversight or review of compliance;

- Considering the proposal of legislation to remedy some of the gaps in the current system for protecting human subjects.

- Implementing educational workshops and an active dialogue with international partners with whom Federal agencies cooperate in human research to develop common ethical principles and to ensure the rights of human subjects are protected, e.g. specific activities proposed by NASA.

Individual Recommendations and Summary Responses:

Recommendation 9: Efforts to ensure centrality of ethics in the conduct of human subjects research.

Summary Response: NBAC will provide advice and make recommendations to the National Science and Technology Council and other appropriate government entities in the areas of bioethical issues arising from research on human biology and behavior and the clinical applications of that research. NBAC will also identify broad principles to govern the ethical conduct of research. The IAWG staff has identified activities carried out in recent years to address this issue as well as major new efforts to upgrade or expand these activities that will be carried out by HHS, DOE, DOD, and the National Aeronautics and Space Administration (NASA). These are discussed below.

Recommendation 10: Changes IRBs in five critical areas: better focus on studies that pose more than minimal risk; better mechanisms for providing information to potential subjects that distinguishes research from treatment; realistically explain benefits, and clearly describe the potential for discomfort and pain; better mechanisms for providing information to potential subjects on sponsors and purposes of the research; better mechanisms for providing information to potential subjects on financial implications; and recognition that the IRBs must determine if the quality of the science justifies the risk.

Summary Response: The IAWG staff has agreed that agencies will instruct IRBs to be responsive to these recommendations and will provide oversight and review to ensure compliance. The IAWG staff will work with NBAC and the National Science and Technology Council in carrying out these recommendations.

Recommendation 11: A mechanism for the continuing interpretation of ethical rules in a public forum.

Summary Response: It is expected that NBAC will develop and maintain a forum for implementing this continuing review and interpretation of ethical rules.

Recommendation 12: Improving the rights and interests of military personal with respect to human subject research by reviewing policies and procedures, educating officers and investigators, maximizing voluntariness, and maintaining a registry of volunteers.

Summary Response: DOD has agreed to a number of specific steps including revising directives or Military Department regulations to meet these proposals and incorporating appropriate training into courses for commanders and senior leadership as well as those involved in human subjects research.

Recommendation 13: Improving the current Federal system for protecting the rights and interests of human subjects in the areas of oversight, sanctions, and scope.

Summary Response: In addition to Federal agencies undertaking specific activities in response to this recommendation, some of which are described below, it is expected that NBAC will fully address this recommendation in carrying out its responsibilities.

Recommendation 14: Resolving the longstanding issue of whether and how all persons injured in the future from Federally funded research should be compensated.

Summary Response: It is expected that NBAC will address this issue.

Current Agency Activities: As part of the Executive Order, all agencies that are involved in current human subject research (not only those agencies represented on the IAWG) are required to review this research in the light of the Advisory Committee recommendations and report to NBAC. Agencies are currently completing this review. The following are specific activities that have been undertaken by IAWG agencies in relation to, or as a result of, this review.

The Department of Energy:

- Developed a newly revised handbook on protecting human subjects which is in pre-publication review. The handbook specifically addresses issues raised by the Advisory Committee on informed consent and classified research.

- Has begun a program of regular site visits, for education and review, to its facilities performing human subjects research. Each site will be visited approximately once every three years.

- Requested all DOE laboratories to provide a sample of current informed consent documents. These will be reviewed by a team charged with improving and monitoring the quality of these documents.

- Requested all laboratories to provide plans that detail local activities to improve the human subjects research review system.

- Issued a brochure to educate the DOE community on human subjects protection, updated its human subjects research database, held its annual human subjects workshop and created a World Wide Web Home Page on human subject programs.

The Department of Defense:

- Reviewed in detail DOD's existing policies and procedures for the protection of human subjects of research and has undertaken extensive revision of DOD Directive 3216.2, "Protection of Human Subjects in DOD Supported Research."

- Proposed changes to current policies that would:

  - Adopt investigator assurances of familiarity with the Nuremberg code, the Belmont Report, the Common Rule and related requirements;

- Incorporate research ethics into graduate medical education curricula at Military Department teaching hospitals;

- Include specific language in the revised directive that would emphasize the expedited review process for certain categories of minimal risk research that are detailed in the Common Rule (32 CFR 219);

- Require education in human subjects regulations: in the executive level of training for commanders and senior civilians who may be involved in human subjects research and for individual investigators, IRB members, research administrators, and support personnel; and

- Ensure that officers and senior NCOs in the chain of command not be present during research recruitment briefings of personnel under their command, and that and ombudsman be present at group recruitment briefings.

The National Aeronautics and Space Administration:

- Established an external Bioethics Policy Task Force to review all NASA human use research policies and procedures, chaired by Baruch Brody, Ph.D., Leon Jawarski Professor of Biomedical Ethics and Director of the Center for Ethics, Medicine and Public Issues at Baylor College of Medicine. The final report of the Task Force was provided on February 14, 1996. In collaboration with the Task Force, NASA enhanced the conduct of human subjects research so that it satisfies the requirements both of the Federal Common Rule and of the highest principles of research ethics.

- Updated the NASA Management Instruction (NMI) on the conduct of Human Research, issued on August 8, 1995, to reflect the Federal Common Rule and incorporate the relevant recommendations reflected in the Advisory Committee's final report. NASA Headquarters has also established a process for oversight and assurance.

- Conducted internal reviews at Headquarters, Johnson Space Center, and Ames Research Center to ensure that elements of the Common Rule and Advisory Committee recommendations were incorporated into agency and Center instructions.

- Because much of its future space research will be conducted with its partners on the International Space Station, has conducted the first in a series of forums to inform NASA's international biomedical community on issues related to the ethics of human subjects research. These workshops will effect a transnational understanding of the sensitivity to ethical issues in human research and ensure that all international partners support common ethical principles regarding the protection of human subjects. A common consent form for use on the international space station was agreed upon and will undergo periodic review.

- Initiated ethics forums on the Common Rule and protection of human subjects for its domestic biomedical research community.

The Central Intelligence Agency:

- Obtained the services of a prominent ethicist from the academic community to become a permanent voting member of the Agency's Human Subject Research Panel (HSRP).

- Revised agency regulations to indicate that all research carried out or sponsored by the Agency that utilizes human subjects shall be brought to the HSRP for approval. The Chairman must certify as exempt or approve a research proposal before it can proceed, and final approval rests with the Agency Director.

- Disseminated an Agency Bulletin to all employees specifying the rationale and function of the panel and necessity of referring human subject research to it for approval.

- Revised the Agency's Contracting Manual to guarantee that HSRP approval is obtained prior to approval of any contract involving human subject research.

The Department of Health and Human Services:

- Designated the Office for Protection from Research Risks, National Institutes of Health, to coordinate the preparation of the NBAC report with information drawn from the Public Health Service agencies and other operating divisions.

- Began activities to improve the procedures for protecting human subjects; for example, CDC is developing an on-line education system in research integrity and ethics that will be mandatory for investigators.

- Ensured that the Food and Drug Administration will respond to NBAC, not only as part of the Department, but also in its capacity as a regulator of research done by private industry.

Other Agencies:

- VA has planned IRB site visits to review procedures and their Office of Research and Development is reviewing its policy manual to identify any needed revisions.

- The Department of Education anticipates reporting to NBAC on ongoing training activities, and efforts to disseminate information through guidance documents and establish networks within that Department.

- The Environmental Protection Agency (EPA) is planning to issue an internal order implementing the Common Rule.

- The Consumer Product Safety Commission is updating and changing its internal documents and policies.

SECRECY AND OPENNESS

Recommendation 15: a) No waiver of informed consent for classified research and informing the potential subjects of the identity of the sponsoring agency and that classified research is involved and b) For classified research, establishing an independent panel, whose records are permanent, to review scientific merit, risk/benefit, consent, and whether subjects need a security clearance.

Summary Response: The IAWG staff proposes that the President and/or Agency Head direct all departments and agencies that, effective immediately, there will be no waivers of informed consent for Federally funded classified research. Also, in all Federally funded classified research, two additional elements of information be provided when consent is sought from potential human subjects: 1) the identity of the sponsoring Federal agency and 2) a statement that the project involves classified information.

NBAC should then evaluate whether the Federal rules governing human subjects protection should be revised to codify these directives.

The IAWG staff is reluctant to propose creating a new oversight body for 15(b) but proposes to use the current IRB system which already must include at least one member not affiliated with the institution. The IRBs could be directed to ensure that participation of non-government persons in reviewing the classified research by establishing a dedicated panel or ensuring that all IRB members have the necessary clearances.

Recommendation 16: a) Review by an independent panel of any planned environmental release where any aspect involves secrecy and b) Environmental oversight of classified programs (now done by EPA) should include keeping review records permanently and reporting to Congress.

Summary Response: EPA, in conjunction with Federal agencies conducting classified programs, has an initiative underway to improve environmental oversight and establish more rigorous regulatory procedures for classified

facilities. Creating a new regulatory entity would add to the bureaucratic complexities of ensuring environmental safety but the views of EPA will be sought on whether additional steps are necessary to ensure robust environmental oversight of classified facilities and programs.

It is the understanding of the IAWG staff that the Advisory Committee is not asking for an expansion of EPA's authority under current laws. The IAWG staff proposes that permanent files on classified environmental impact statements and environmental review of classified activities be maintained by EPA.

Recommendation 17: Ensuring historical records are organized and accessible by 1) hastening movement of records to Archives; 2) making indexes and finding aids readily available; 3) improving public access to records in the custody of agencies; 4) maintaining records of document destruction; and 5) reviewing policies governing access to records of grantees and contractors.

Summary Response: For 1, 2, 3, and 5, the IAWG staff agrees with moving aggressively down the path to openness exemplified by this project and will work to make government records more accessible including using new technology to enhance access. For 4, the IAWG staff would propose making the records themselves of classified human subject research permanent and the records of destruction of all human subject research permanent.

Current Agency Activities: IAWG members have initiatives underway to ensure that information retrieved for the human radiation experiments project is readily available to the public, and to respond to specific Advisory Committee recommendations on openness.

The Department of Energy:

- The Department has produced three publications which include background information, record series descriptions, topical essays, a list of over 400 experiments, and oral histories. Most of this information, along with over 250,000 scanned historical documents, is located on the

Internet, with paper copies of all documents at the Coordination and Information Center (CIC) in Nevada.

- In response to Advisory Committee recommendations, DOE is
  - Transferring over 3,000 cubic feet of records to the National Archives; and
  - Making finding aids to records still in agency custody more readily available to the public, and has prepared records access guidance.

The Department of Defense:

- The Department is preparing a guide similar to the DOE *Roadmap* that will describe DOD documents found during the human radiation records search. These documents will be available on the Internet and hard copies will be deposited at the CIC.
- DOD is expediting its response to Freedom of Information Act requests concerning human radiation experiment subjects.

The National Aeronautics and Space Administration:

- NASA will maintain a permanent collection of human radiation experiment records and database at Johnson Space Center and a process for submission of an response to requests for information has been developed.
- The agency is also working to make radiation research documents available on the Internet. The agency is creating a NASA Radiation Review Homepage which summarizes the agency's search and findings.

The Central Intelligence Agency:

- The CIA is transferring approximately 1,000 pages of declassified documents and a CIA Inspector General report on human subject research

procedures to the National Archives. The documents will also be available on the Internet.

- The agency is reviewing for declassification a few documents relevant to the MKULTRA program that had not been previously declassified and released. An independent review of the CIA's record system has been undertaken by the National Archives and will be completed in approximately six months.

Health and Human Services and the Department of Veterans Affairs:

- These agencies are preparing documents for availability on the Internet sometime in the spring or summer of 1996. Paper copies have been transferred to the National Archives.

Recommendation 18 : a) Review of CIA recordkeeping by CIA Inspector General or other groups with special attention to facilitating public access and b) Priority given to declassification of CIA historical records such as MKULTRA.

Summary Response: The National Archives has begun a scheduled review of CIA's records management program, including records access issues and the CIA has agreed to give top priority to declassification of human subjects research records.

STATEMENT OF

ASSISTANT SECRETARY

TARA O'TOOLE, M.D., M.P.H.

DEPARTMENT OF ENERGY

BEFORE THE

COMMITTEE ON GOVERNMENTAL AFFAIRS

UNITED STATES SENATE

CONCERNING HUMAN RADIATION EXPERIMENTS

MARCH 12, 1996

STATEMENT OF TARA O'TOOLE, M.D., M.P.H.
BEFORE THE COMMITTEE ON GOVERNMENTAL AFFAIRS
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INTRODUCTION AND SUMMARY

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear before the Committee today and provide you with an update on the continuing work of the Department of Energy (DOE) in response to the human radiation experiments initiative. I will speak to you today both in my capacity as Assistant Secretary of Energy for Environment, Safety and Health, and as the chair of the staff of the Interagency Working Group (IAWG), which has been directed by President Clinton to respond to the recommendations of the Advisory Committee on Human Radiation Experiments. The IAWG was established in January 1994 to coordinate the government's response to human radiation experiment issues and consists of the Cabinet Secretaries of the Departments of Energy, Health and Human Services (HHS), Defense (DOD), and Veterans Affairs (VA), the Attorney General (DOJ), the Administrator of the National Aeronautics and Space Administration (NASA), and the Directors of the Central Intelligence Agency (CIA), and Office of Management and Budget (OMB).

My testimony will cover recent activities of the IAWG staff, including preparation of a draft preliminary response to the recommendations of the Advisory Committee on Human

Radiation Experiments These recommendations are the result of 18 months of intense deliberation, the review of thousands of documents, and public meetings both in Washington and across the country that involved presentations by many concerned citizens Two weeks ago, the Administration sponsored a two-day stakeholder workshop to receive input to this draft response The IAWG staff are actively seeking ways to make human radiation experiment information more useful and accessible to citizens

I will also discuss the work being done by DOE to carry out the human radiation experiments initiative begun over two years ago, and to keep this effort strong. We are working closely with citizens and stakeholders to respond to specific inquiries. We actively continue to locate, release, declassify, and generally improve access to DOE records and information on this and related subjects.

Finally, the Administration is working to improve protections for citizens who are subjects in current human subjects research President Clinton's October 1995 Executive Order required Federal agencies to review their entire program of current human subjects research in light of the Advisory Committee's recommendations and to report on this review to the National Bioethics Advisory Commission. The Office of Energy Research has completed this requirement and is now engaged in: a systematic review of DOE site activities in relation to human subjects protection; efforts to improve informed consent documentation, and efforts to better educate scientists, administrators, and Institutional

Review Board (IRB) members about their responsibilities in the area of human subjects protection

Let me emphasize the continuing commitment of President Clinton, Secretary O'Leary, and the entire IAWG to make government accountable to the people, make information about government activities easily available, be responsive to citizen concerns, and seek citizen input on the range of issues associated with the human radiation experiments effort

BRIEF HISTORY OF THE HUMAN RADIATION EXPERIMENTS INITIATIVE

The issue of government sponsored human radiation experiments has been examined with increasing intensity over the past two decades. In the mid-1970s, then-Representative Al Gore chaired hearings which focused on whole body irradiation treatments for cancer patients, conducted by the Oak Ridge Institute of Nuclear Studies. No final report was issued and no wrongdoing found

Representative Ed Markey chaired hearings in 1986 and issued the report, "Human Guinea Pigs", which detailed experiments involving some 600 human subjects The "plutonium experiments" were publicly discussed in detail in this report. The research involved in "Human Guinea Pigs" served as a starting point for the exhaustive search to come in the 1990s

In late 1993, Eileen Welsome's Pulitzer-Prize winning investigative report for the Albuquerque Tribune on the plutonium injection subjects brought the topic to the attention of Energy Secretary Hazel O'Leary. Secretary O'Leary's outrage, expressed in a December 1993 press conference on openness in DOE, inspired tremendous media response and public outcry. The Human Radiation Experiments Helpline was immediately established and received over 17,000 calls from citizens in the first month alone. President Clinton promptly issued an Executive Order directing all relevant Federal agencies to search their records for information on radiation experiments.

This Executive Order also established the IAWG in early 1994. Individual agencies organized research teams to locate and examine records. The extensive DOE search for records of Department of Energy and predecessor agency human radiation experimentation was difficult for a number of reasons. The records universe to be searched was huge -- an estimated 3.2 million cubic feet (one cubic foot is about the size of a case of Coca Cola bottles and contains between 2,500 and 3,000 pages!). Moreover, these records were in multiple locations and geographically dispersed from coast to coast.

In addition, there was no single subject index or finding aid to help DOE's Office of Human Radiation Experiments (OHRE) sort through this records universe. Most human experimentation records had been created more than twenty years ago and few in DOE were familiar with such old records. The records were created by decentralized

governmental and contractor institutions with substantial autonomy. As a result, there were few central files arranged according to standardized filing schemes. Some files had been reorganized and moved over the years, so that what were once single collections stored in one place might now be three or four stored in two to four different places. Most of the records had originally been created for purposes other than facilitating a search for documentation on human radiation experiments and therefore did not easily lend themselves to this search. Over 200 people from the Department were involved in this search process.

One important purpose of the records search was to provide the Advisory Committee on Human Radiation Experiments with documents for review. The Advisory Committee membership, appointed by President Clinton in early 1994, was charged with advising the IAWG and the President of the ethical implications of the experiments. The Committee included medical doctors, radiation biologists, lawyers, ethicists, historians, and one citizen representative. When the Advisory Committee was formed, we had no idea of the number of government sponsored radiation experiments or the extent of the documentation that would have to be reviewed. The Executive Order establishing the Committee required a review of radiation experiments from 1944 to 1974, which was the year of the first Federal regulations protecting human subjects, and to sample later experiments for ethical problems. The Advisory Committee also investigated the

adequacy of present-day informed consent documentation by reviewing a sample of current research projects

The Advisory Committee members and staff reviewed hundreds of thousands of documents and spoke with hundreds of citizens and stakeholders. The Committee's meetings and research took them across the country in search of information. All Advisory Committee meetings were held in public, in accord with the Federal Advisory Committee Act (FACA) and all drafts of the Committee's interim and final reports were also public. The charter of the Committee was extended to 18 months, at the Committee's request, to allow a more thorough review and deliberation. The Committee's final conclusions were presented to President Clinton in a 900 page report on October 3, 1995.

At the White House ceremony in which President Clinton accepted the Committee's report, he apologized to the victims. "While most of the tests were ethical by any standards, some were unethical, not only by today's standards, but by the standards of the time in which they were conducted. They failed both the test of our national values and the test of humanity. So today," he said, "on behalf of another generation of American leaders and another generation of American citizens, the United States of America offers a sincere apology to those of our citizens who were subjected to these experiments, to their families, and their communities."

The same day, President Clinton signed an Executive Order establishing the National Bioethics Advisory Commission (NBAC), which will continuously review and identify principles governing human subjects research. President Clinton simultaneously directed all Federal agencies sponsoring human subjects research to review and improve their human subjects protections in light of the Advisory Committee's recommendations and to report on this review to NBAC. He also instructed the Cabinet to use and build on these recommendations to devise a system of relief, including compensation, where appropriate, that meets the standards of justice and conscience.

CURRENT ACTIVITIES OF THE INTERAGENCY WORKING GROUP STAFF

In response to the 18 recommendations in the Advisory Committee's final report, the IAWG staff has drafted a preliminary paper which lays out a proposed set of government actions. The government continued in its commitment to public involvement by receiving citizen input on this draft during a two-day stakeholder/citizen workshop sponsored by the IAWG staff at the end of February 1996. Over 120 people participated in the workshop, including citizens who believe they were/are experiment subjects, their advocates, government representatives, and invited experts. Discussion was intense and stakeholders were highly critical of the Committee's recommendations, as well as the preliminary proposed government response. Citizens want the government to respond to a wide range of matters relating to radiation exposures, many of which do not fall under

the category of "human radiation experiments" as defined in the Advisory Committee's charge.

In response to strong citizen concerns expressed at the workshop, the IAWG staff is examining ways to involve the public more extensively in government decisionmaking on the issues of human subjects research. Citizen proposals include:

- The reform of the IRB process to include greater citizen representation and more effective, community-based review of human subjects research.

- Facilitation of better access to government decisionmakers for citizen groups; and

- Ways to enable citizens to work with government to develop appropriate search tools to help members of the public independently access information about human radiation experiments.

Two important and potentially controversial issues raised by the Advisory Committee recommendations are compensation and medical follow-up and notification for human radiation subjects. As to the issue of compensation, representatives of the families of most, if not all, of the subjects identified by the Advisory Committee have already

pursued claims against the government and the Administration has engaged or will engage in discussions with them

In the areas of subject notification and medical follow-up, citizens at the stakeholder workshop criticized the Advisory Committee recommendations and the IAWG staff draft responses They advocated the notification of all subjects who have participated in government sponsored radiation experiments and the provision of funds for comprehensive medical care, managed at the local level, for all persons involved in the experiments

The following discussion sets forth the salient issues on this topic.

The Advisory Committee recommended against notification and medical follow-up of human radiation experiment participants because two criteria were not met. The Committee recommended that these two criteria form the basis for decisions on notification and medical follow-up The criteria were:

1) Risk, including both the remaining lifetime risk of mortality from the exposure and the potential risks from medical follow-up; and

2) The medical utility of early detection and treatment for changing the course of disease or the quality or length of life.

Should other experiments of concern come to light in the future, these criteria should govern the decision to notify subjects and pursue monitoring interventions.

It is an unfortunate fact that the practical, logistical task of identifying, locating, and notifying participants in past government sponsored radiation experiments and/or their descendants would entail an enormously expensive, time-consuming effort that promises to be futile in most cases.

Although the Advisory Committee's database includes documentation describing approximately 4,000 government-sponsored human radiation experiments, no list of participants exists for most of the experiments. For example, 3,000 of the 4,000 experiments were sponsored by the VA. According to Advisory Committee staff, there are subject names for only a tiny fraction of these experiments. In the isolated cases where participant lists are available, scores of researchers would be needed to track down persons whose whereabouts have been unknown to the government for several decades. It is probable that most subjects have changed names, died, or moved to other parts of the country and to locations around the globe.

The Advisory Committee also felt that there would be little or no medical benefit to subjects -- and possibly new risks -- from this vast endeavor. These potential risks include medical harm and discomfort, the possibility of incorrect test results, the possibility of stigmatization by friends, family, insurers, and employers, and potential financial costs to the subjects and their families.

In the Advisory Committee's judgment, almost all of the experiments involved small radiation doses, producing less than 1/1,000 remaining lifetime risk of cancer death. This level is minimal compared with the normal risk of dying of cancer (220 out of 1,000). Many of the experiments involved tracer doses, similar to those used in medical diagnostic procedures today to diagnose cancer and heart disease.

The unfortunate reality is that there are very few effective screening procedures for the detection of an early-stage cancer. Medicine, with all the progress made over the past 50 years, does not have -- with few exceptions -- accepted methods of detecting cancer early that can result in prolongation of life or altering the course of disease in persons who are not known to be at high risk for cancer. Our health care system and the vast bulk of medical research efforts emphasize the treatment of disease, not its prevention.

With regard to brain, head, and neck cancers among children and military personnel exposed to nasopharyngeal radium treatments, the Advisory Committee did find that these

subjects exceeded the 1/1,000 threshold for lifetime cancer risk but they found neither an accepted nor a recommended screening procedure for these tissues. A recent conference on this subject, jointly sponsored by the V.A. Centers for Disease Control, and Yale University, did not recommend notification of these subjects. However, the question of what, if any, follow-up these individuals should receive remains controversial.

In addition, the Advisory Committee found no persuasive evidence to indicate that subjects of human radiation experiments have greater likelihood than the general population of incurring genetic effects, meaning those effects passed on to children of experiment subjects. Again, this is not surprising since the decades of research on atomic bomb survivors -- exposed to vastly more radiation -- have not detected genetic effects. Therefore, the Advisory Committee did not recommend notification or medical follow-up for descendants of subjects of human radiation experiments.

We recognize the anguish that subjects and their descendants may feel, even when there is little the government may be able do for them. The position of the IAWG staff on these issues has not yet been finalized. There is currently no Federal program that compensates citizens harmed in the course of Federally-sponsored research. Our concern and sympathy for those who were subjects of experiments must be balanced against the fact that the provision of government sponsored medical insurance to experiment participants could be fraught with difficulties. There are also important questions of

parity with citizens exposed to chemicals, drugs, or radiation from other government activities.

Notification and follow-up are among the most contentious aspects of the Advisory Committee report. Our compassion for citizens who were unwitting participants should -- first and foremost -- fuel efforts to prevent this type of behavior by government and future researchers.

This preliminary draft Federal response to the Advisory Committee recommendations remains a work in progress. A variety of options, including both those generated by government representatives and by stakeholders, are still under discussion. These options are being reviewed for fairness, cost-effectiveness, responsiveness to public concerns, and consistency with Administration policies and with the Department's openness initiative.

DOE HUMAN RADIATION EXPERIMENTS INITIATIVES

DOE wants to take this opportunity to report on the achievements of the Office of Energy Research and our continuing hard work in the area of human radiation experiments. We maintain an ongoing program to work closely with citizens and stakeholders to provide information about past human radiation experiments. Case managers continue to review DOE records and research constituent inquiries. More than 3,000 cases have been intensively researched, responding to over 16,000 inquiries from

the public and members of Congress DOE has sent more than 20,000 responses to citizens, from acknowledgement of inquiries to determination of the extent of participation in experiments

The Department continues to locate and make available records and information relating to human radiation research DOE has already located over 250,000 pages of documents that are available in hard copy at a number of locations. They are also on the Internet in such a way that they can be searched, viewed, and printed in their original forms. Many more cubic feet of records were provided to the Advisory Committee for their review and more than 6,000 documents have been declassified for this project.

DOE has also published three important reports which serve as useful research tools:

- *Human Radiation Experiments: The Department of Energy Roadmap to the Story and the Records*, released in February 1995, includes project background, site histories, records series descriptions, topical essays, and a preliminary list of experiments

- *Human Radiation Experiments Associated with the United States Department of Energy and its Predecessors*, released in July 1995, contains

a listing, description, and selected references for 435 documented human radiation studies dating back to World War II.

- *Human Radiation Studies: Remembering the Early Years*, completed November 1995, consists of a 29-part series of oral histories whose purpose is to enrich the documentary record, provide missing information, and allow an opportunity for the researchers to provide their perspective.

In addition, we also conducted quality assurance reviews of the search methodologies at 17 field facilities and DOE headquarters to ensure that record searches complied with guidance and that the search was credible and thorough. These reviews resulted from a commitment to the General Accounting Office and to Senator Glenn that DOE would do a quality check on human radiation experiment project activities across the complex. Teams were sent to each site to ensure that the site followed the OHRE guidance, and to determine whether the search was properly documented and any outstanding sources of information remained to be investigated. The teams performed random searches through site finding aids and document files to test whether any pertinent collections had been overlooked.

At each stage of this search effort, the Department has documented what was done and why. This will enable those who come after us to know where we have been and what

we have done. Our goal is not to have the final word, but to leave behind a record of our activities that historians, policymakers, Congress, and the American people can use to understand, debate, and evaluate this aspect of our history.

The activities in which we are now actively engaged are logical extensions of the path DOE has followed throughout this project. The Advisory Committee recommended that DOE transfer a number of important collections of records to the National Archives, and the two agencies are currently negotiating the transfer of over 3,500 cubic feet of DOE records for the National Archives' permanent collection. Also, in response to an Advisory Committee recommendation, DOE has initiated a project to place "finding aids," that will improve access to those records still in DOE custody, in agency reading rooms across the country. In addition, DOE is working closely with DOD to help ensure that all documents from IAWG agencies are accessible via the Internet, using the same search tools currently employed for the DOE documents.

As additional experiments or documents are located, they are incorporated into the DOE information system in both electronic and hard copy format. The Department is continuing an active program of declassification review in response to the President's recent Executive Order.

THE MARSHALL ISLANDS MEDICAL PROGRAM

The Department of Energy provides special medical care and logistical support to the remaining population of the Rongelap and Utirik atolls of the Republic of the Marshall Islands (RMI) who were exposed to radiation, resulting from the 1954 United States thermonuclear "Bravo" test. The Marshallese were not specifically included in the Advisory Committee's charter for two primary reasons. First, the Rongelap and Utirik populations were exposed to radiation, not as part of human experimentation, but rather through fallout as a result of the U.S. nuclear weapons testing program. Second, as noted above, a lifetime program of medical care and compensation, supported by the Department, is already in place for these exposed populations.

The Department's medical program currently provides twice a year medical screening and full medical care for radiogenic conditions for the remaining 137 out of 253 exposed Rongelap and Utirik individuals. Any exposed person who has medical findings suggesting a malignant neoplasm, or other radiation-related disease, is referred to secondary or tertiary medical facilities for definitive evaluation and therapy. Those persons with problems that can be effectively managed in Majuro or Kwajalein are referred to the Marshallese Health Services. Those requiring a more extensive evaluation are referred to hospitals in Honolulu or, for the special cases of thyroid and pituitary lesions, the National Institutes of Health in Bethesda, Maryland.

The Department started, during 1995, to transition from previous vessel-based medical missions to land-based medical missions. Vessel-based missions were handicapped by the inability to keep a vessel equipped with state-of-the art medical equipment. The land-based approach will improve the quality and affect cost efficiencies in medical care for the exposed populations in Rongelap and Utirik. This approach will make available, at existing Marshall Islands' medical facilities, more sophisticated diagnostic equipment and improved laboratory analytical capabilities for the aging Rongelap and Utirik populations. Examples of improvements offered by land-based medical capabilities include:

- Year-round use of newly purchased current ultrasound equipment;

- Immediate diagnosis of thyroid nodules, ability to do immediate fine needle aspiration or thyroid surgery locally in the RMI as well as surgical removal of gastrointestinal tumors;

- Availability of certified mammography equipment at Kwajalein which meets the higher more stringent U.S. mammography standards for mammography equipment and technician qualifications; and

- Better radiography capabilities and diagnostics permitting immediate follow-up, additional tests and surgery when needed.

As with vessel-based care, the land-based system will provide continued visits to infirm patients in their homes at Mejatto and Utirik with the added ability to provide full diagnostics and tests of samples taken right after the visit to these remote islands at the newly-established land-based facilities. Because of the limited diagnostic equipment on the vessel, many of these samples were formerly shipped to the U.S. mainland for analysis.

The Advisory Committee recommended that the Department's medical program for citizens of the Marshall Islands continue, as long as any members of the exposed population remain alive. The Department has no plans to discontinue its program of surveillance, screening, and medical care for the Marshallese people.

The Advisory Committee also recommended that DOE's program be reviewed to determine if expansion to include other Marshallese populations is warranted. Based on an evaluation of currently available radiation exposure data, the Department does not believe there is a need for the expansion of the Marshall Islands medical program. For example, current data show that the radiation doses to the thyroids of the exposed individuals in the mid-belt atolls (i.e., Ailuk and Likiep) are only 10 to 25 percent of the doses received by exposed individual at Utirik. Nevertheless, the Department is funding an RMI-requested study by the Centers for Disease Control and Prevention (CDC) to compare the incidence rates of benign and malignant thyroid cancer in populations

throughout the Marshall Islands and to estimate the dose response for radioactive fallout and thyroid neoplasm. This feasibility study is to be completed by June 1996, with a presentation of results to RMI by September 1996. The results of this study will need to be evaluated jointly by CDC, DOE, and the Marshallese in light of existing data to determine the scientific basis for expanding the Department's current medical screening and medical care program.

Finally, the Committee recommended that the government consider whether the Marshallese people should be involved in future research decisions that affect them and that an independent review be conducted of the current DOE medical program. The government of RMI has agreed with the Advisory Committee in requesting an independent evaluation of DOE's program. The RMI government wants a review process in which they can fully participate. The Department is in the process of consulting with the Marshallese on the various approaches which can be used to accomplish this goal. The Department anticipates that its mission in the Marshall Islands will remain a clinical one and will continue not to involve medical research.

CURRENT HUMAN SUBJECTS PROTECTION AT DOE

Research on humans performed in accordance with ethical and humanitarian principles allows experiments to be performed that provide medical and scientific benefits to individuals and to the Nation. Medical research led to the development of the polio

vaccine. Radiation research brought us treatments for cancer and diagnostic procedures to pinpoint medical problems. It is important to remember that many lives have been saved and many more will be saved using diagnoses and treatments of diseases derived through medical research

Federal regulations have been promulgated to assure that human subjects are fully protected from potential abuses in research experimentation. It is the policy of the Department that the rights and welfare of human subjects involved in research supported or sanctioned by DOE be protected in accordance with the Federal Policy for the Protection of Human Subjects and, until the requirements of DOE policies and orders have been met, no site research activity involving human subjects shall be initiated.

DOE is improving protections for citizens who are subjects in DOE-sponsored current human research This is an ongoing, active DOE program into which the recommendations of the Advisory Committee have been incorporated. Human subjects research at DOE encompasses a variety of studies -- many funded by other agencies in recognition of the expertise and facilities only available at DOE sites. This research encompasses such lifesaving research as non-invasive diagnostic imaging technologies to see into the human body, advanced cancer therapies using radiation and radio-immune therapy, nuclear medicine techniques that allow exploration of fundamental and pathological processes, and development of biomarkers and cellular assays for monitoring

and protecting the health of DOE workers and the general public. Studies of de-identified worker records for disease patterns, surveys of occupant comfort in weatherized buildings, security detectors, and studies involving surveys of smokers or runners for health insights are also among the diverse projects that come under the rubric of "human subjects research."

It is important to note that human subjects studies are not done just to test the effects of chemicals or radiation on volunteers Effects studies just to "see what happens" are not done by DOE or any Federal agency and recent press releases about research conducted many decades ago may have contributed to confusion with regard to the science-based studies and IRB reviewed biomedical research that is currently being conducted. In contemporary studies, radiation or chemicals are only employed where a therapeutic or diagnostic protocol has been approved by a human studies board following scientific peer review

The Office of Health and Environmental Research within the Office of Energy Research (OHER) has the responsibility for approval and assurance of all human subjects projects conducted at Departmental facilities or with Departmental funds. The research conducted must meet the highest standards of both scientific/technical excellence and bioethical conduct OHER also implements and oversees both the Departmental and Federal policy for the protection of human subjects within DOE.

In December 1993, when Secretary of Energy O'Leary began her "openness initiative," DOE had well-established oversight for its facilities in relation to current human subject research. These were utilized to finally put "on-line" a publicly available electronic human subjects research project database. Prior to the openness initiative, this data existed only in paper copy. It is widely searched both domestically and abroad. The Fiscal Year 1994 database access information is provided with this report as backup to the testimony. The Fiscal Year 1995 database is now ready to go on-line with all research projects involving humans conducted at DOE sites, or performed with DOE funds or personnel.

DOE proactively undertook a review of its sites by the DOE Health and Environmental Research Advisory Committee (HERAC) as part of the DOE openness initiative. The HERAC reported that DOE had an excellent system in place. HERAC did make some useful suggestions, the majority of which were adopted by DOE. The primary recommendation was for the establishment of a regular system of performance reviews to evaluate human subjects regulatory compliance by DOE at all sites. This review process began last month at four California sites -- three Laboratories and one DOE field office. These reviews are designed to be interactive and educational between the review team and the site and to suggest local improvements or provide guidance on issues not resolved by the 1991 common rule. In summary, a DOE human subjects performance review was undertaken in 1994, and this process will formally continue. Approximately

every three years, using outside ethicists, scientists, and laypersons as reviewers, each Laboratory will be revisited. Other details on DOE's activities in current human subject protection can be found in the attached report to NBAC.

CONCLUSION

In closing, let me focus on the central role of openness in the Clinton Administration. Over the past several decades, the American people's trust in the institutions of government has greatly eroded. Many complex factors have contributed to this erosion, not least among them the secrecy associated with our Cold War nuclear competition with the Soviet Union. Without judging the historical necessity of secrecy, it is a fact that the ability of the government to perform its post-Cold War missions is greatly impeded by pervasive public distrust of its motives and competence.

To help remedy that distrust, we have told the story of human radiation experiments to the best of our ability, even though it required this Administration to disclose historical episodes that are embarrassing, discomforting, or even worse. As part of our commitment to openness in government, we are now fully engaged in an active, forward-looking effort to continue to provide information and services to the public and to ensure that the mistakes of the past will not be repeated.

Thank you. I will be pleased to answer any questions the Committee may have.

STRATEGIC ALIGNMENT INITIATIVE STAFFING

Mr. Myers. Provide a detailed staffing table by organization showing the Strategic Alignment Initiative (SAI) profile of both FTE and end of year staffing through completion of the SAI, using fiscal year 1995 as the baseline.

Secretary O'Leary. The Strategic Alignment Initiative profile of both FTEs and end of year staffing is shown in a table which I would like to insert in the record. (The information follows:)

Strategic Alignment Initiative Staffing Profile

Organization	DOE FY 1995 Alloc	FY 1996 FTE Request	FY 1996 EOY Employment	FY 1997 FTE Request	FY 1997 EOY Employment	FY 1998 FTE Request	FY 1998 EOY Employment	FY 1999 FTE Request	FY 1999 EOY Employment	FY 2000 FTE Request	FY 2000 EOY Employment
Field Management	99	80	66	66	66	64	61	61	60	59	58
CFO	280	265	253	253	253	231	208	203	198	195	192
Civilian Waste Mgt	220	220	216	202	187	178	168	164	160	157	153
Congr/Public/Cons Affairs	131	112	104	103	98	97	95	94	92	91	90
Defense Programs	335	352	337	311	284	269	253	247	240	235	230
Econ Impact & Diversity	60	51	50	49	47	47	47	47	46	46	45
Energy Eff/Renewable En	649	580	538	506	484	471	458	453	448	445	441
Energy Information Admin	486	447	430	407	384	369	354	348	342	339	335
Energy Research	359	330	325	311	292	281	269	265	260	258	255
Environmental Mgt	840	676	648	618	567	547	527	518	508	501	493
Environ Safety & Health	485	433	431	420	413	388	363	354	344	337	330
Fissile Materials Disposition	20	21	21	21	20	18	16	16	15	15	14
Fossil Energy	257	217	203	191	191	185	179	178	176	176	175
General Counsel	224	207	200	184	181	177	173	166	158	155	152
Hearings & Appeals	89	67	67	60	53	52	50	48	45	45	45
Human Resources & Admin	962	823	765	749	749	723	697	685	673	666	658
Inspector General	356	354	354	331	307	290	272	266	260	257	254
Nonpro & Nat'l Security	359	351	351	349	332	312	292	288	284	281	278
Nuclear Energy	153	146	140	131	123	117	110	108	106	105	104
Naval Reactors	60	59	58	58	58	58	58	58	58	58	57
Office of Secretary	30	24	24	24	23	23	22	22	21	21	20
Quality Mgmt	12	11	11	11	10	10	10	10	9	9	8
Office of Policy	225	194	180	172	172	166	159	158	156	155	154
Sec Energy Advisory Brd	9	6	6	6	6	7	7	7	6	6	6
Science Educ/Tech Info	30	0	0	0	0	0	0		0		0
Research & Develop Mgmt	18	0	0	0	0	0	0		0		0
Worker & Com Trans	18	16	16	16	16	16	15	15	15	15	15
Unallocated	30		97		(1)		(27)		(27)		(25)
Tech LDP	50		0								
HQ Target	6,846	6,042	5,891	5,549	5,315	5,090	4,836	4,772	4,653	4,621	4,537

Organization	DOE FY 1995 Alloc	FY 1996 FTE Request	FY 1996 EOY Employment	FY 1997 FTE Request	FY 1997 EOY Employment	FY 1998 FTE Request	FY 1998 EOY Employment	FY 1999 FTE Request	FY 1999 EOY Employment	FY 2000 FTE Request	FY 2000 EOY Employment
SPECIAL PURPOSE OFFICES											
Ofc of Sci & Tech Info	164	141	140	135	130	126	122	120	118	117	116
Naval Petro Reserves	57							0	0	0	0
Casper	*14*	11	11	11	11	0					
Elk Hills	*43*	45	45	45	45	0					
Golden Field Office	42	46	46	56	56	54	52	52	52	52	52
Energy Technology Ctrs	626					558	557	557	556	556	556
Morgantown	*317*	279	279	277	275						
Pittsburgh	*309*	282	258	284	283						
Bureau of Mines		527	527	85	85	85	85	85	85	85	85
Naval Reactors	149										
Pittsburgh	*79*	77	75	73	74	74	73	72	71	71	71
Schenectady	*70*	68	68	67	67	67	66	66	65	64	63
Strategic Petrol Reserves	130	116	112	116	108	108	107	107	106	106	106
Spec Purpose Targt	1,168	1,592	1,561	1,149	1,134	1,071	1,062	1,058	1,053	1,051	1,049
OPERATIONS/FIELD OFFICES											
Albuquerque	1,606	1,550	1,506	1,481	1,451	1,444	1,436	1,424	1,411	1,359	1,307
Chicago	596	566	543	527	532	524	515	514	513	507	501
Idaho	462	444	421	415	405	400	395	394	393	390	387
Nevada	410	383	372	357	343	331	318	312	306	300	293
Oakland	441	415	396	389	382	374	365	364	362	352	342
Oak Ridge	772	707	673	646	634	620	605	601	597	579	560
Ohio	250	235	235	235	234	234	234	234	234	234	234
Richland	581	550	531	523	515	508	500	495	490	483	475
Rocky Flats	302	299	297	289	288	288	287	287	287	287	287
Savannah River	623	566	567	539	513	503	492	489	485	477	468
Centers of Excellence - Savings *					-57		-57		-57		-57
Field Target	6,043	5,715	5,541	5,401	5,240	5,222	5,090	5,113	5,021	4,966	4,797
DOE TOTAL	14,057	13,349	12,993	12,099	11,689	11,382	10,988	10,942	10,727	10,638	10,383

Strategic Alignment Initiative Staffing Profile

Organization	DOE FY 1995 Alloc	FY 1996 FTE Request	FY 1996 EOY Employment	FY 1997 FTE Request	FY 1997 EOY Employment	FY 1998 FTE Request	FY 1998 EOY Employment	FY 1999 FTE Request	FY 1999 EOY Employment	FY 2000 FTE Request	FY 2000 EOY Employment
POWER MARKETING ADMINS											
Alaska	35	35	35	34	34	0	0	0	0	0	0
Bonneville	3,440	3,272	3,272	3,272	3,272	3,272	3,272	3,210	3,210	3,210	3,210
Southeastern	41	41	41	40	40	40	40	38	38	38	38
Southwestern	196	195	195	192	192	188	188	185	185	185	185
Western Area	1,467	1,417	1,417	1,387	1,387	1,387	1,387	1,387	1,387	1,387	1,387
TOTAL PMAs	5,179	4,960	4,960	4,925	4,925	4,887	4,887	4,820	4,820	4,820	4,820
FERC	1,463	1,453	1,453	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463
GRAND TOTAL	**20,699**	19,762	**19,406**	18,487	**18,077**	17,732	**17,338**	17,225	**17,010**	16,921	16,666

* Centers of Excellence are unallocated SAI savings based on consolidation of Administrative functions in the Field

Note FY 1996 FTE Request and EOY Employment numbers include the Bureau of Mines, which was not a part of DOE in FY 1995
When evaluated on a comparable basis the staffing reduction from FY95 to FY96 would be significantly larger

FORWARD FUNDING OF CONSTRUCTION PROJECTS

Mr. Myers. The President's budget includes a request for forward funding of several projects in the Department, but the numbers shown in the government-wide general provisions do not tie to anything shown in the Department's detailed budget justification. Please explain these funding discrepancies.

Secretary O'Leary. Good budgeting requires that appropriations for the full costs of asset acquisition be provided up front to help ensure that all costs and benefits are fully taken into account when decisions are made about providing resources. In most cases this rule is followed throughout the Government. When it is not followed and fixed assets are funded in increments, without certainty if or when future funding will be available, it can and occasionally does result in poor planning, acquisition of assets not fully justified, higher acquisition costs, cancellation of major projects, the loss of sunk costs, and inadequate funding to maintain and operate the assets.

Historically, construction projects in DOE and several other agencies have been funded incrementally. In a significant step toward full up front funding of all government acquisitions, the President's Budget requests $1.4 billion in the government-wide general provisions to fully fund a number of projects in DOE and other agencies that might have been funded in increments in past years. This funding is over and above the amounts requested by the specific agencies. Next year additional effort will be made to include up front funding for all new projects.

Of the $398 million provided to DOE, $216 million is associated with Energy Research (ER) projects and $182 million is associated with Environmental Management (EM) projects. The language in the general provisions requests that the funds be transferred to the parent accounts in the agencies acquiring the assets.

The Energy Research projects in the government-wide general provisions include the Combustion Research Facility, Phase II at Sandia National Laboratories in Livermore, CA. ($13 million), B-Factory at the Stanford Linear Accelerator Center ($35 million), Fermilab Main Injector ($37 million), and the Relativistic Heavy Ion Collider at Brookhaven National Laboratory ($131 million). The total request of $216 million is the difference between incremental funding and full funding for these activities. The facilities will allow the Department to conduct experiments and perform research in the areas of high energy physics, nuclear physics, and combustion research.

In addition to the general provision funds, ER's detailed budget justification for FY 1997 includes $171 million in total for the projects mentioned above. This includes $9 million to incrementally fund the Combustion Research Facility, Phase II, $45 million for the B-Factory, $52 million for the Fermilab Main Injector, and $65 million for the Relativistic Heavy Ion Collider. The amounts requested in the general provisions will appear as outyear requirements in the detailed budget justification.

The $182 million requested for EM is needed to privatize various operations to improve public sector efficiency. The projects include such activities as the Advanced Mixed Waste Treatment Project at Idaho ($77 million), Mixed Waste Treatment at Oak Ridge ($15 million), Transuranic

Waste Treatment at Oak Ridge ($70 million) and $20 million for a list of other EM projects which has not yet been finalized. These projects rely on a contractor to design, permit, finance, construct and operate the necessary facility. The contractor is then paid for providing waste management services meeting the Department's performance specifications. The $182 million is needed up front to honor the contract termination liability clause if the government were to terminate any of these contracts for its own convenience. Unless the government terminates the contract, the funds will not outlay until the completed facilities are operational and are providing the service required. The funds therefore are not expected to outlay until approximately three to four years after contract award.

In addition to the funds being proposed in the government-wide general provisions, EM's detailed budget justification for FY 1997 includes $185 million for privatization of the tank waste treatment at Hanford. This approach is similar to the one being proposed for the items mentioned above and is being pursued to reduce costs.

PROGRAM DIRECTION SUMMARY

Mr. Myers. List every DOE operations, field, site, area, project, support office, or any other type of office. For each, provide the location (city and state), number of FTEs, funding to maintain the office staff and office space, and the programmatic funding administered by each office. This information is requested for fiscal years 1995, 1996 and 1997.

Secretary O'Leary. In response to this question, I would like to insert the following spreadsheet for the record:

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Energy Efficiency & Renewable Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	55,881	—
Chicago Operations Office	—	—	—	—	—	—	—	11,382	—
Golden Field Office	1,664	332	—	1,057	3,053	22	139	184,158	—
Idaho Operations Office	132	9	—	—	141	2	71	15,358	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	19,773	—
Oakland Operations Office	—	—	—	—	—	—	—	9,500	—
Pittsburgh Energy Technology Center	—	—	—	—	—	—	—	240	—
Richland Operations Office	—	—	—	—	—	—	—	2,142	—
Washington, DC	10,510	516	1,000	3,155	15,181 a/	129	118	86,589	—
Total, Energy Efficiency & Renewable Energy	12,306	857	1,000	4,212	18,375	153	120	385,023	—
Nuclear Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	120	—	—	—	120	1	120	28,690	—
Chicago Operations Office	1,136	61	—	83	1,280	12	107	135,736	3,838
Idaho Operations Office	100	33	—	25	158	1	158	11,955	—
Nevada Operations Office	—	—	—	—	—	—	—	300	—
Oak Ridge Operations Office	1,027	66	—	187	1,280	13	98	28,041	—
Oakland Operations Office	435	42	—	35	512	5	102	38,229	—
Ohio Field Office	—	—	—	—	—	—	—	8,850	—
Richland Operations Office	515	35	—	—	550	6	92	9,498	55,300
Savannah River Operations Office	—	—	—	—	—	—	—	13,980	—
Washington, DC	13,105	930	1,658	5,936 b/	21,629	139	156	7,256	1,262
Total, Energy Supply Research and Development	16,438	1,167	1,658	6,266	25,529 c/	177 d/	144	282,535	60,400 e/
Uranium Supply and Enrichment Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	1,170	—
Chicago Operations Office	—	—	—	68	68 f/	—	—	1,680	—
Idaho Operations Office	—	2	—	27	29 g/	—	—	—	—
Nevada Operations Office	—	—	—	—	—	—	—	506	—
Oak Ridge Operations Office	1,607	132	—	690	2,429	33	74	72,762	—
Oakland Operations Office	130	30	—	5	165	2	83	8,493	—
Ohio Field Office	—	1	—	—	1 h/	—	—	—	—
Richland Operations Office	—	—	—	—	—	—	—	100	—
Washington, DC	1,540	135	—	43	1,718	21	82	137	—
Total, Uranium Supply and Enrichment Activities	3,277	300	—	833	4,410	56 d/	79	84,848	—
Total, Nuclear Energy	19,715	1,467	1,658	7,099	29,939	233	128	367,383	60,400
Naval Reactors									
Other Defense Activities									
Idaho Operations Office	800	50	—	20	870	10	87	45,400	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	32,000	—

a/ Includes $583,000 of program direction included in the In-House Energy Management budget

b/ Working Capital Fund costs for all Headquarters NE staff are centrally managed in NE ESR&D account

c/ Includes $2,065,000 of program direction included in the Isotope Support budget

d/ Reflects actual FTEs; budget submission reflects end of year staffing

e/ Funded from the Other Defense Activities account

f/ $68,000 funds reimbursable work at New Brunswick Lab for measurement activities in support of Uranium programs

g/ Expenses for travel and training for measurements monitoring in support of Uranium programs

h/ Expenses for travel and training for measurements monitoring in support of Uranium programs

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources	
Pittsburgh Energy Technology Center	5,397	100	—	650	6,147	78	79	341,100	—	—
Schenectady Naval Reactors Office	4,120	80	—	400	4,600	69	67	288,285	—	—
Washington, DC	6,330	460	—	170	6,960	59	118	928	—	—
Total, Naval Reactors	16,647	690	—	1,240	18,577	216	86	707,713	—	—
Civilian Radioactive Waste Management										
Energy Supply Research and Development										
Idaho Operations Office	—	—	—	—	—	—	—	278	—	—
Richland Operations Office	—	—	—	—	—	—	—	293	—	—
Washington, DC	107	3	—	—	110	2	55	9	—	—
Total, Energy Supply Research and Development	107	3	—	—	110	2	55	580	—	—
Nuclear Waste Disposal Fund										
Albuquerque Operations Office	—	—	—	—	—	—	—	24,090	13,703	—
Chicago Operations Office	—	—	—	—	—	—	—	3,181	—	—
Idaho Operations Office	156	15	—	88	259	2	130	2,951	—	—
Nevada Operations Office	8,888	369	—	2,824	12,081	111	109	71,388	21,409	—
Oak Ridge Operations Office	79	9	—	1	89	1	89	1,378	—	—
Oakland Operations Office	—	—	—	—	—	—	—	2,565	19,685	—
Richland Operations Office	71	13	—	—	84	1	84	323	—	—
Washington, DC	11,058	445	—	3,343	14,846	143	104	259,395	74,633	—
Total, Nuclear Waste Disposal Fund	20,252	851	—	6,256	27,359	258	106	365,271	129,430 a/	—
Total, Civilian Radioactive Waste Management	20,359	854	—	6,256	27,469	260	106	365,851	129,430	—
Alaska Power Administration										
Alaska Power Administration										
Power Marketing Administrations	2,342	250	290	206	3,088	30	103	3,404	—	—
Bonneville Power Administration										
Bonneville Power Administration										
Power Marketing Administrations	211,000	8,000	20,000	—	239,000	3,313	72	2,840,000	—	—
Southeastern Power Administration										
Southeastern Power Administration										
Power Marketing Administrations	2,325	172	71	716	3,284	42	78	27,249	—	—
Southwestern Power Adminstration										
Southwestern Power Administration										
Power Marketing Administrations	11,678	1,047	2,952	1,307	16,984	196	87	13,564	—	—
Western Power Administration										
Western Area Power Administration										
Power Marketing Administrations	70,052	6,749	14,814	12,319	103,934	1,258	83	221,672	—	—
Colorado River Basin Fund										
Power Marketing Administrations	13,236	993	10,119	1,893	26,241	209	126	79,716	—	—
Total, Western Power Administration	83,288	7,742	24,933	14,212	130,175	1,467	89	301,388	—	—
Energy Research										
Energy Supply Research and Development										
Albuquerque Operations Office	—	—	—	—	—	—	—	107,828	—	—
Chicago Operations Office	6,003	480	310	615	7,408	73	101	719,750	—	—
Idaho Operations Office	—	—	—	—	—	—	—	16,387	—	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	234,931	—	—
Oakland Operations Office	206	15	3	82	306	2	153	391,107	—	—

a/ Funded from the Defense Nuclear Waste Disposal account

FY 1995 Department of Energy Program Direction

	Program Direction ($000)							Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs	Average Cost per FTE ($000)	Direct Approp	Other Funding Sources
Richland Operations Office	—	—	—	—	—	—	—	126,491	—
Savannah River Operations Office	—	—	—	—	—	—	—	1,303	—
Washington, DC	31,058	2,390	3,976	5,829	43,253	347	125	94,958	—
Total, Energy Supply Research and Development	37,267	2,885	4,289	6,526	50,967	422	121	1,692,755	—
General Science and Research									
Albuquerque Operations Office	—	—	—	—	—	—	—	40,519	—
Chicago Operations Office	1,484	75	165	181	1,905	18	106	563,849	—
Oak Ridge Operations Office	649	105	—	225	979	8	122	92,489	—
Oakland Operations Office	619	40	29	121	809	7	116	252,259	—
Richland Operations Office	—	—	—	—	—	—	—	9,764	—
Washington, DC	5,202	565	660	1,280	7,707	63	122	59	—
Total, General Science and Research	7,954	785	854	1,807	11,400	96	119	958,939	—
Total, Energy Research	45,221	3,670	5,143	8,333	62,367	518	120	2,651,694	—
Science and Technical Information									
Energy Supply Research and Development									
Oak Ridge Operations Office	8,760	165	400	595	9,920	145	68	1,595	—
Washington, DC	250	30	—	—	280	3	93	4,200	—
Total, Science and Technical Information	9,010	195	400	595	10,200	148	69	5,795	—
Defense Programs									
Weapons Activities									
Albuquerque Operations Office	86,115	10,441	54,285	24,216	175,057	1,332	123 a/	1,716,705	—
Chicago Operations Office	—	—	—	—	—	—	—	22,300	—
Idaho Operations Office	—	—	—	—	—	—	—	9,301	—
Nevada Operations Office	19,653	1,066	15,422	2,424	38,565	307	126	231,026	—
Oak Ridge Operations Office	4,680	600	1,363	4,107	10,750	77	140	390,926	—
Oakland Operations Office	6,617	850	1,035	5,240	13,742	87	158	416,386	—
Ohio Field Office	—	—	—	—	—	—	—	6,955	—
Richland Operations Office	—	—	—	—	—	—	—	24,631	—
Rocky Flats Field Office	—	—	—	—	—	—	—	52,380	—
Savannah River Operations Office	595	50	482	948	2,075	8	259	125,277	—
Washington, DC	36,610	4,181	48,765	35,497	125,053	366	292 b/	-1,366	—
Total, Defense Programs	154,270	17,188	121,352	72,432	365,242	2,177	168	2,994,521	—
Nonproliferation and National Security									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	199,055	—
Chicago Operations Office	3,413	175	—	2,239	5,827	62	94	14,252	—
Idaho Operations Office	—	—	—	—	—	—	—	7,428	—
Nevada Operations Office	652	80	350	11	1,093	9	121	15,988	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	24,210	—
Oakland Operations Office	—	—	—	—	—	—	—	70,057	—
Ohio Field Office	—	—	—	—	—	—	—	1,073	—
Pittsburgh Energy Technology Center	—	—	—	—	—	—	—	2,292	—
Richland Operations Office	—	—	—	—	—	—	—	29,396	—
Rocky Flats Field Office	—	—	—	—	—	—	—	1,200	—
Savannah River Operations Office	—	—	—	—	—	—	—	6,113	—
Schenectady Naval Reactors Office	—	—	—	—	—	—	—	724	—
Washington, DC	33,858	2,791	29,354	12,524	78,527	363	216	47,515	—
Total, Nonproliferation and National Security	37,923	3,046	29,704	14,774	85,447	434	197	419,303	—

a/ Excludes $10,990,000 for Los Alamos Community Assistance Program reflected in Other Related Expenses

b/ Excludes $18,000,000 for CAMP/CAS program included in Other Related Expenses

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Fissile Materials Disposition									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	18,202	—	—
Chicago Operations Office	—	—	—	—	—	—	—	9,829	—	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	7,782	—	—
Oakland Operations Office	—	—	—	—	—	—	—	7,160	—	—
Richland Operations Office	—	—	—	—	—	—	—	257	—	—
Savannah River Operations Office	—	—	—	—	—	—	—	1,555	—	—
Washington, DC	169	300	321	636	1,426	11	130	4,035	—	—
Total, Fissile Materials Disposition	169	300	321	636	1,426	11	130	48,820	—	—
Worker and Community Transition									
Other Defense Activities									
Albuquerque Operations Office	—	—	74	—	74	—	—	31,871	—	—
Idaho Operations Office	—	—	—	—	—	—	—	325	—	—
Nevada Operations Office	—	—	—	—	—	—	—	16,587	—	—
Oak Ridge Operations Office	—	—	131	—	131	—	—	2,932	—	—
Oakland Operations Office	—	—	387	—	387	—	—	387	—	—
Ohio Field Office	—	—	—	—	—	—	—	11,400	—	—
Pittsburgh Energy Technology Center	—	—	250	—	250	—	—	400	—	—
Power Marketing Administrations	—	—	—	—	—	—	—	82	—	—
Richland Operations Office	—	—	32	—	32	—	—	145	—	—
Rocky Flats Field Office	—	—	—	—	—	—	—	23,900	—	—
Savannah River Operations Office	—	—	—	—	—	—	—	31,847	—	—
Washington, DC	2,007	100	1,102	185	3,394	12	356 [a]	—	—	—
Total, Worker and Community Transition	2,007	100	1,976	185	4,268	12	356	119,876	—	—
Environmental Management									
Defense Environmental Rest. & Waste Mgmt.									
Albuquerque Operations Office	17,957	1,918	4,254	451	24,580	231	106	506,496	127,435	—
Chicago Operations Office	7,110	642	4,744	431	12,927	92	141	28,370	71,218	—
Idaho Operations Office	22,717	1,207	3,302	3,735	30,961	281	110	482,316	11,086	—
Morgantown Energy Technology Center	1,183	118	2,451	20	3,772	14	269	49,024	—	—
Nevada Operations Office	4,120	258	2,216	378	6,972	57	122	62,365	—	—
Oak Ridge Operations Office	11,958	1,012	3,658	3,752	20,380	156	131	315,315	228,681	259,627
Oakland Operations Office	5,870	347	1,987	1,278	9,482	79	120	82,467	33,726	—
Ohio Field Office	14,645	766	5,443	1,849	22,703	226	100	339,267	142,604	—
Pittsburgh Energy Technology Center	156	45	118	13	332	2	166	10,085	—	—
Richland Operations Office	41,979	1,720	35,813	12,846	92,358	538	172	1,336,969	81,614	—
Rocky Flats Field Office	22,100	1,715	5,913	1,162	30,890	277	112	573,883	—	—
Savannah River Operations Office	39,698	1,790	36,615	948	79,051	527	150	1,467,023	292	—
Washington, DC	39,553	4,674	109,191	10,336	163,754 [b]	741	221	360,198	38,877	41,700
Total, Environmental Management	229,046	16,212	215,705	37,199	498,162	3,221	155	5,613,778	735,533 [c]	301,327 [d]
Environment, Safety and Health									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	1,340	—	—
Chicago Operations Office	—	—	—	—	—	—	—	7,431	—	—
Idaho Operations Office	—	—	—	—	—	—	—	6,258	—	—

a/ Includes all support services costs

b/ Includes $1,500.00 for the Technical Leadership Development Program

c/ Funded from the Energy Supply Research and Development account

d/ Funded from the Uranium Enrichment Decontamination and Decommissioning Fund account

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Oak Ridge Operations Office	—	—	—	—	—	—	—	23,630	—
Oakland Operations Office	—	—	—	—	—	—	—	9,571	—
Richland Operations Office	—	—	—	—	—	—	—	9,792	—
Savannah River Operations Office	—	—	—	—	—	—	—	191	—
Washington, DC	37,245	2,145	240	5,483 a/	45,113	347	130	24,967	—
Total, Energy Supply Research and Development	37,245	2,145	240	5,483	45,113	347	130	83,180	—
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	90	—
Chicago Operations Office	—	—	—	—	—	—	—	1,508	—
Idaho Operations Office	—	—	—	—	—	—	—	423	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	613	—
Oakland Operations Office	—	—	—	—	—	—	—	1,361	—
Richland Operations Office	—	—	—	—	—	—	—	10,036	—
Washington, DC	9,060	1,105	125	520	10,810	105	103	46,036	—
Total, Other Defense Activities	9,060	1,105	125	520	10,810	105	103	60,067	—
Total, Environment, Safety and Health	46,305	3,250	365	6,003	55,923	452	124	143,247	—
Human Resources and Administration									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	50	—
Idaho Operations Office	—	—	—	—	—	—	—	750	—
Rocky Flats Field Office	—	—	—	—	—	—	—	192	—
Washington, DC	60,944	2,215	24,896	40,021	128,076	920	139	916	—
Total, Human Resources and Administration	60,944	2,215	24,896	40,021	128,076	920	139	1,908	—
Chief Financial Officer									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	—	1,800
Chicago Operations Office	—	—	—	—	—	—	—	—	150
Idaho Operations Office	—	—	—	—	—	—	—	—	1,255
Oak Ridge Operations Office	—	—	—	—	—	—	—	—	7,234
Oakland Operations Office	—	—	—	—	—	—	—	—	8,385
Richland Operations Office	—	—	—	—	—	—	—	—	32
Savannah River Operations Office	—	—	—	—	—	—	—	—	3,500
Washington, DC	16,652	231	5,011	3,944	25,838	278	93	—	2,000 b/
Total, Chief Financial Officer	16,652	231	5,011	3,944	25,838	278	93	—	24,356
Policy and Program Evaluation									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	145	—
Chicago Operations Office	—	—	—	—	—	—	—	1,054	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	552	—
Oakland Operations Office	—	—	—	—	—	—	—	305	—
Richland Operations Office	—	—	—	—	—	—	—	372	—
Washington, DC	15,108	671	—	3,225	19,004	196	97	7,147	—
Total, Policy and Program Evaluation	15,108	671	—	3,225	19,004	196	97	9,575	—
Congressional, Public & Intergovernmental Affairs									
Departmental Administration									
Washington, DC	9,378	159	—	1,834	11,371	118	96	100	—

a/ Working Capital Fund costs for all Headquarters EH staff are centrally managed in EH ESR&D account

b/ Funded through Cost of Work for Others in the Departmental Administration account

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp	Other Funding Sources	
General Counsel										
Departmental Administration										
Washington, DC	13,879	154	1,350	2,782	18,165	163	111	—	—	—
Economic Impact and Diversity										
Departmental Administration										
Albuquerque Operations Office	—	—	—	—	—	—	—	100	—	—
Chicago Operations Office	—	—	—	—	—	—	—	855	—	—
Golden Field Office	—	—	—	—	—	—	—	102	—	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	695	—	—
Oakland Operations Office	—	—	—	—	—	—	—	225	—	—
Washington, DC	4,034	114	—	777	4,925	51	97	1,118	—	—
Total, Economic Impact and Diversity	4,034	114	—	777	4,925	51	97	3,095	—	—
Office of Secretary										
Departmental Administration										
Washington, DC	3,049	360	—	7	3,416	27	127	—	—	—
Office of Inspector General										
Inspector General										
Albuquerque Operations Office	2,593	274	474	388	3,729	36 a/	104	—	—	—
Chicago Operations Office	1,152	122	—	172	1,446	16 b/	90	—	—	—
Dallas Support Office	143	15	—	22	180	2	90	—	—	—
Idaho Operations Office	650	69	—	97	816	9	91	—	—	—
Nevada Operations Office	506	53	—	76	635	7	91	—	—	—
New Orleans	506	53	—	76	635	7	91	—	—	—
Oak Ridge Operations Office	2,449	259	686	367	3,761	34	111	—	—	—
Oakland Operations Office	1,225	129	—	183	1,537	17 c/	90	—	—	—
Ohio Field Office	720	76	—	108	904	10	90	—	—	—
Pittsburgh Energy Technology Center	937	99	—	140	1,176	13	90	—	—	—
Power Marketing Administrations	1,011	107	—	151	1,269	14 d/	91	—	—	—
Richland Operations Office	865	91	—	129	1,085	12	90	—	—	—
Savannah River Operations Office	1,296	137	—	194	1,627	18	90	—	—	—
Washington, DC	10,378	1,095	590	3,133	15,196	144	106	—	—	—
Total, Office of Inspector General	24,431	2,579	1,750	5,236	33,996	339	100	—	—	—
Board of Contract Appeals										
Departmental Administration										
Washington, DC	750	7	—	6	763	8	95	—	—	—
Field Operations										
Energy Supply Research and Development										
Chicago Operations Office	20,074	530	—	7,566	28,170	315	89	—	—	—
Idaho Operations Office	10,570	471	100	12,073	23,214	151	154	—	—	—
Oak Ridge Operations Office	25,097	429	4	10,381	35,911	400	90	—	—	—
Oakland Operations Office	16,185	451	1,502	5,690	23,828	247	96	—	—	—
Washington, DC	8,169	320	3,847	3,974	16,310	89	183	—	—	—
Total, Field Operations	80,095	2,201	5,453	39,684	127,433	1,202	106	—	—	—
Total, FY 1995	1,131,931	73,231	464,330	272,921	1,942,913	16,185 e/	120	17,023,287	949,719	301,327

a/ Thirty FTEs are located at the Albuquerque Ops Office six are located at Los Alamos National Lab

b/ Eight FTEs are located at the Chicago Ops Office eight are located at the Princeton Plasma Physics Lab

c/ All seventeen FTEs are located at Lawrence Livermore National Lab

d/ Nine FTEs are located at WAPA five are located at Bonneville PMA

e/ Does not include 1,411 FTEs authorized for the Federal Energy Regulatory Commission

FY 1995 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources	
Summary by Appropriation										
Energy Supply Research and Development	192,468	9,453	13,040	62,766	277,727	2,451	113	2,449,868	60,400	—
Uranium Supply and Enrichment Activities	3,277	300	—	833	4,410	56	79	84,848	—	—
General Science and Research	7,954	785	854	1,807	11,400	96	119	958,939	—	—
Weapons Activities	154,270	17,188	121,352	72,432	365,242	2,177	168	2,994,521	—	—
Defense Environmental Rest. & Waste Mgmt.	229,046	16,212	215,705	37,199	498,162	3,221	155	5,613,778	735,533	301,327
Other Defense Activities	65,806	5,241	32,126	17,355	120,528	778	155	1,355,779	—	—
Departmental Administration	123,794	3,911	31,257	52,596	211,558	1,761	120	14,678	24,356	—
Inspector General	24,431	2,579	1,750	5,236	33,996	339	100	—	—	—
Alaska Power Administration	2,342	250	290	206	3,088	30	103	3,404	—	—
Bonneville Power Administration	211,000	8,000	20,000	—	239,000	3,313	72	2,840,000	—	—
Southeastern Power Administration	2,325	172	71	716	3,284	42	78	27,249	—	—
Southwestern Power Administration	11,678	1,047	2,952	1,307	16,984	196	87	13,564	—	—
Western Area Power Administration	70,052	6,749	14,814	12,319	103,934	1,258	83	221,672	—	—
Colorado River Basin Fund	13,236	993	10,119	1,893	26,241	209	126	79,716	—	—
Nuclear Waste Disposal Fund	20,252	851	—	6,256	27,359	258	106	365,271	129,430	—
Total, FY 1995	1,131,931	73,731	464,330	272,921	1,942,913	16,185	120	17,023,287	949,719	301,327
Summary by Site										
Albuquerque Operations Office	106,785	12,633	59,087	25,055	203,560	1,600	127	2,732,232	142,938	—
Chicago Operations Office	40,372	2,085	5,219	11,355	59,031	588	100	1,521,177	75,206	—
Dallas Support Office	143	15	—	22	180	2	90	—	—	—
Golden Field Office	1,664	332	—	1,057	3,053	22	139	184,260	—	—
Idaho Operations Office	35,125	1,856	3,402	16,065	56,448	456	124	599,130	12,341	—
Morgantown Energy Technology Center	1,183	118	2,451	20	3,772	14	269	49,024	—	—
Nevada Operations Office	33,819	1,826	17,988	5,713	59,346	491	121	398,160	21,409	—
New Orleans	506	53	—	76	635	7	91	—	—	—
Oak Ridge Operations Office	56,306	2,777	6,242	20,305	85,630	867	99	1,249,624	235,915	259,627
Oakland Operations Office	31,287	1,904	4,943	12,634	50,768	446	114	1,290,072	61,796	—
Ohio Field Office	15,365	843	5,443	1,957	23,608	236	100	367,545	142,604	—
Pittsburgh Energy Technology Center	6,490	244	368	803	7,905	93	85	354,117	—	—
Power Marketing Administrations	311,644	17,318	48,246	16,592	393,800	5,062	78	3,185,687	—	—
Richland Operations Office	43,430	1,859	35,845	12,975	94,109	557	169	1,560,209	136,946	—
Rocky Flats Field Office	22,100	1,715	5,913	1,162	30,890	277	112	651,555	—	—
Savannah River Operations Office	41,589	1,977	37,097	2,090	82,753	553	150	1,647,289	3,792	—
Schenectady Naval Reactors Office	4,120	80	—	400	4,600	69	67	289,009	—	—
Washington, DC	380,003	26,096	232,086	144,640	782,825	4,845	162	944,197	116,772	41,700
Total, FY 1995	1,131,931	73,731	464,330	272,921	1,942,913	16,185	120	17,023,287	949,719	301,327

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs	Cost per FTE ($000)	Direct Approp.	Other Funding Sources
Energy Efficiency & Renewable Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	40,814	— —
Chicago Operations Office	—	—	—	—	—	—	—	16,545	— —
Golden Field Office	1,795	300	—	747	2,842	22	129	138,447	— —
Idaho Operations Office	138	10	—	—	148	2	74	15,540	— —
Morgantown Energy Technology Center	—	—	—	—	—	—	—	1,000	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	1,400	— —
Ohio Field Office	—	—	—	—	—	—	—	14,947	— —
Richland Operations Office	—	—	—	—	—	—	—	1,300	— —
Washington, DC	10,129	491	—	2,517	13,137 a/	121	109	44,451	— —
Total, Energy Efficiency & Renewable Energy	12,062	801	—	3,264	16,127	145	111	274,444	— —
Nuclear Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	130	5	—	—	135	1	135	32,381	— —
Chicago Operations Office	1,170	50	—	25	1,245	12	104	110,927	2,100 —
Idaho Operations Office	90	10	—	5	105	1	105	8,348	— —
Nevada Operations Office	—	—	—	—	—	—	—	285	— —
Oak Ridge Operations Office	450	30	—	40	520	2	260	20,300	— —
Oakland Operations Office	—	—	—	—	—	—	—	7,880	— —
Ohio Field Office	1,020	59	—	225	1,304	10	130	21,553	— —
Richland Operations Office	495	17	—	—	512	6	85	4,350	27,000 —
Savannah River Operations Office	—	—	—	—	—	—	—	9,860	— —
Washington, DC	11,770	534	144	4,468 b/	16,916	130	130	23,980	900 —
Total, Energy Supply Research and Development	15,125	705	144	4,763	20,737 c/	162 d/	128	239,864	30,000 e/ —
Uranium Supply and Enrichment Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	50	— —
Chicago Operations Office	—	—	—	250	250 f/	—	—	3,350	— —
Oak Ridge Operations Office	90	13	—	5	108	2	54	8,314	— —
Ohio Field Office	1,671	105	—	824	2,600	33	79	72,279	— —
Richland Operations Office	—	—	—	—	—	—	—	570	— —
Washington, DC	1,414	321	—	320	2,055	16	128	324	— —
Total, Uranium Supply and Enrichment Activities	3,175	439	—	1,399	5,013	51 d/	98	84,887	— —
Total, Nuclear Energy	18,300	1,144	144	6,162	25,750	213	121	324,751	30,000 —
Naval Reactors									
Other Defense Activities									
Idaho Operations Office	830	30	—	10	870	10	87	51,000	— —
Pittsburgh Energy Technology Center	4,820	100	—	630	5,550	75	74	338,180	— —
Schenectady Naval Reactors Office	4,220	80	—	400	4,700	68	69	271,868	— —
Washington, DC	6,800	480	—	130	7,410	58	128	2,620	— —
Total, Naval Reactors	16,670	690	—	1,170	18,530	211	88	663,668	— —

a/ Includes $342,000 of program direction included in the In-House Energy Management budget

b/ Working Capital Fund costs for all Headquarters NE staff are centrally managed in NE ES&D account

c/ Includes $1,580,000 of program direction included in the Isotope Support budget

d/ Reflects authorized FTEs; budget submission reflects end of year staffing

e/ Funded from the Other Defense Activities account

f/ $250,000 funds reimbursable work at New Brunswick Lab for measurement activities in support of Uranium programs

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp	Other Funding Sources
Civilian Radioactive Waste Management									
Nuclear Waste Disposal Fund									
Albuquerque Operations Office	—	—	—	—	—	—	—	5,335	11,111 —
Chicago Operations Office	—	—	—	—	—	—	—	500	— —
Idaho Operations Office	164	12	—	92	268	2	134	60	— —
Nevada Operations Office	9,818	362	—	3,184	13,364	114	117	9,839	28,664 —
Oak Ridge Operations Office	—	—	—	—	—	—	—	3,885	8,106 —
Ohio Field Office	68	2	—	1	71	1	71	280	— —
Richland Operations Office	73	12	—	—	85	1	85	65	— —
Washington, DC	11,734	273	—	3,526	15,533	130	119	102,341	200,519 —
Total, Civilian Radioactive Waste Management	21,857	661	—	6,803	29,321	248	118	122,305	248,400 a/ —
Alaska Power Administration									
Alaska Power Administration									
Power Marketing Administrations	2,474	261	296	177	3,208	35	92	1,052	— —
Bonneville Power Administration									
Bonneville Power Administration									
Power Marketing Administrations	212,000	11,000	20,000	—	243,000	3,272	74	3,081,000	— —
Southeastern Power Administration									
Southeastern Power Administration									
Power Marketing Administrations	2,458	246	103	665	3,472	41	85	26,430	— —
Southwestern Power Adminstration									
Southwestern Power Administration									
Power Marketing Administrations	13,294	1,005	2,009	1,432	17,740	195	91	13,008	— —
Western Power Administration									
Western Area Power Administration									
Power Marketing Administrations	78,355	7,504	14,223	17,580	117,662	1,252	94	163,570	— —
Colorado River Basin Fund									
Power Marketing Administrations	14,420	1,048	9,906	1,736	27,110	208	130	102,304	— —
Total, Western Power Administration	92,775	8,552	24,129	19,316	144,772	1,460	99	265,874	— —
Energy Research									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	98,898	— —
Chicago Operations Office	5,371	386	254	461	6,472	65	100	568,198	— —
Idaho Operations Office	—	—	—	—	—	—	—	10,467	— —
Oak Ridge Operations Office	162	15	—	10	187	2	94	344,415	— —
Ohio Field Office	—	—	—	—	—	—	—	178,694	— —
Richland Operations Office	—	—	—	—	—	—	—	123,013	— —
Savannah River Operations Office	—	—	—	—	—	—	—	817	— —
Washington, DC	27,725	1,545	2,470	5,305	37,045	273	136	170,786	— —
Total, Energy Supply Research and Development	33,258	1,946	2,724	5,776	43,704	340	129	1,495,288	— —
General Science and Research									
Albuquerque Operations Office	—	—	—	—	—	—	—	12,553	— —
Chicago Operations Office	1,533	65	140	88	1,826	18	101	572,002	— —
Oak Ridge Operations Office	552	32	33	47	664	7	95	258,425	— —
Ohio Field Office	650	70	—	154	874	8	109	90,869	— —

a/ Funded from the Defense Nuclear Waste Disposal account

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Richland Operations Office	—	—	—	—	—	—	—	5,871	—
Washington, DC	5,205	400	431	1,250	7,286	59	123	31,780	—
Total, General Science and Research	7,940	567	604	1,539	10,650	92	116	971,500	—
Total, Energy Research	41,198	2,513	3,328	7,315	54,354	432	126	2,466,788	—
Science and Technical Information									
Energy Supply Research and Development									
Ohio Field Office	7,710	110	200	500	8,520	138	62	1,176	—
Washington, DC	260	20	—	—	280	3	93	2,000	—
Total, Science and Technical Information	7,970	130	200	500	8,800	141	62	3,176	—
Defense Programs									
Weapons Activities									
Albuquerque Operations Office	87,376	10,943	47,205	25,441	170,965	1,291	124 a/	1,908,172	—
Chicago Operations Office	—	—	—	—	—	—	—	3,320	—
Idaho Operations Office	—	—	—	—	—	—	—	12,994	—
Nevada Operations Office	20,572	1,028	13,650	3,240	38,490	309	125	216,667	—
Oak Ridge Operations Office	6,645	773	900	4,687	13,005	84	155	493,273	—
Oakland Operations Office	—	—	—	—	—	—	—	5,120	—
Ohio Field Office	4,551	560	1,185	3,004	9,300	72	129	428,200	—
Richland Operations Office	—	—	—	—	—	—	—	26,384	—
Rocky Flats Field Office	—	—	—	—	—	—	—	46,524	—
Savannah River Operations Office	1,391	75	402	197	2,065	18	115	154,743	—
Washington, DC	36,631	3,989	34,788	17,700	93,108	352	265	44,652	—
Total, Defense Programs	157,166	17,368	98,130	54,269	326,933	2,126	154	3,340,049	—
Nonproliferation and National Security									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	222,216	—
Chicago Operations Office	3,554	185	—	2,106	5,845	63	93	19,083	—
Idaho Operations Office	—	—	—	—	—	—	—	7,944	—
Nevada Operations Office	546	54	525	3	1,128	9	125	17,710	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	76,414	—
Oakland Operations Office	—	—	—	—	—	—	—	878	—
Ohio Field Office	—	—	—	—	—	—	—	27,661	—
Richland Operations Office	—	—	—	—	—	—	—	40,826	—
Rocky Flats Field Office	—	—	—	—	—	—	—	316	—
Savannah River Operations Office	—	—	—	—	—	—	—	6,749	—
Schenectady Naval Reactors Office	—	—	—	—	—	—	—	712	—
Washington, DC	32,276	2,302	27,721	13,537	75,836	336	226	49,261	—
Total, Nonproliferation and National Security	36,376	2,541	28,246	15,646	82,809	408	203	469,770	—
Fissile Materials Disposition									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	26,995	—
Chicago Operations Office	—	—	—	—	—	—	—	8,250	—
Idaho Operations Office	—	—	—	—	—	—	—	125	—
Nevada Operations Office	—	—	—	—	—	—	—	25	—
Oak Ridge Operations Office	—	—	—	—	—	—	—	9,940	—
Ohio Field Office	—	—	—	—	—	—	—	15,010	—
Richland Operations Office	—	—	—	—	—	—	—	570	—
Rocky Flats Field Office	—	—	—	—	—	—	—	55	—

a/ Excludes $11,290,000 for Los Alamos Community Assistance Program reflected in Other Related Expenses.

FY 1996 Department of Energy Program Direction

	Program Direction ($000)							Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs	Average Cost per FTE ($000)	Direct Approp	Other Funding Sources
Savannah River Operations Office	—	—	—	—	—	—	—	1,535	— —
Washington, DC	2,500	240	273	569	3,582	21	171	4,182	— —
Total, Fissile Materials Disposition	2,500	240	273	569	3,582	21	171	66,687	— —
Worker and Community Transition									
Other Defense Activities									
Albuquerque Operations Office	—	—	144	—	144	—	—	21,505	— —
Idaho Operations Office	—	—	—	—	—	—	—	5,000	— —
Nevada Operations Office	—	—	—	—	—	—	—	6,500	— —
Oak Ridge Operations Office	—	—	235	—	235	—	—	500	— —
Oakland Operations Office	—	—	—	—	—	—	—	1,100	— —
Ohio Field Office	—	—	103	—	103	—	—	325	— —
Pittsburgh Energy Technology Center	—	—	225	—	225	—	—	—	— —
Richland Operations Office	—	—	90	—	90	—	—	—	— —
Rocky Flats Field Office	—	—	—	—	—	—	—	5,100	— —
Washington, DC	2,066	75	1,203	188	3,532	16	271 a/	37,329	— —
Total, Worker and Community Transition	2,066	75	2,000	188	4,329	16	271	77,359	— —
Environmental Management									
Defense Environmental Rest. & Waste Mgmt.									
Albuquerque Operations Office	20,539	1,719	2,961	538	25,757	259	99	494,704	122,376 —
Chicago Operations Office	6,104	571	2,047	479	9,201	102	90	24,978	52,236 —
Idaho Operations Office	22,440	936	3,141	2,475	28,992	272	107	469,712	16,058 —
Morgantown Energy Technology Center	1,200	94	1,144	20	2,458	14	176	76,368	— —
Nevada Operations Office	4,484	220	1,074	1,617	7,395	61	121	68,042	— —
Oak Ridge Operations Office	6,452	299	2,218	1,377	10,346	85	122	84,164	30,685 —
Oakland Operations Office	18,800	776	7,602	2,327	29,505	235	126	375,774	128,118 —
Ohio Field Office	13,389	889	2,436	4,121	20,835	171	122	314,213	193,741 236,807
Pittsburgh Energy Technology Center	188	42	400	8	638	2	319	13,890	— —
Richland Operations Office	43,277	1,390	25,558	12,978	83,203	543	153	1,235,879	60,839 —
Rocky Flats Field Office	23,664	1,438	22,508	1,218	48,828	290	168	535,627	— —
Savannah River Operations Office	42,196	1,491	22,736	9,097	75,520	548	138	1,212,465	4,300 —
Washington, DC	52,283	3,998	64,025	10,767	131,073 b/	676	194	501,537	9,449 42,000
Total, Environmental Management	255,016	13,863	157,850	47,022	473,751	3,258	145	5,407,353	617,802 c/ 278,807 d/
Environment, Safety and Health									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	1,202	— —
Chicago Operations Office	—	—	—	—	—	—	—	6,546	— —
Idaho Operations Office	—	—	—	—	—	—	—	5,876	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	8,582	— —
Ohio Field Office	—	—	—	—	—	—	—	21,624	— —
Richland Operations Office	—	—	—	—	—	—	—	9,000	— —
Savannah River Operations Office	—	—	—	—	—	—	—	173	— —
Washington, DC	32,836	1,750	225	4,504 e	39,315	316	124	31,287	— —
Total, Energy Supply Research and Development	32,836	1,750	225	4,504	39,315	316	124	84,290	— —

a/ Includes all support services costs

b Includes $3,216,000 for the Technical Leadership Development Program and $4,782,000 for EM-wide buyouts

c Funded from the Energy Supply Research and Development account

d/ Funded from the Uranium Enrichment Decontamination and Decommissioning account

e Working Capital Fund costs for all Headquarters EH staff are centrally managed in EH/ESR&D account

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	90	— —
Chicago Operations Office	—	—	—	—	—	—	—	1,530	— —
Idaho Operations Office	—	—	—	—	—	—	—	160	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	1,295	— —
Ohio Field Office	—	—	—	—	—	—	—	280	— —
Richland Operations Office	—	—	—	—	—	—	—	8,918	— —
Washington, DC	10,476	1,175	115	—	11,766	117	101	45,617	— —
Total, Other Defense Activities	10,476	1,175	115	—	11,766	117	101	57,890	— —
Total, Environment, Safety and Health	43,312	2,925	340	4,504	51,081	433	118	142,180	— —
Human Resources and Administration									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	50	— —
Idaho Operations Office	—	—	—	—	—	—	—	575	— —
Washington, DC	54,323	1,750	28,980	27,494	112,547	842	134	375	— —
Total, Human Resources and Administration	54,323	1,750	28,980	27,494	112,547	842	134	1,000	— —
Chief Financial Officer									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	—	2,100 —
Chicago Operations Office	—	—	—	—	—	—	—	—	1,565 —
Golden Field Office	—	—	—	—	—	—	—	—	281 —
Oak Ridge Operations Office	—	—	—	—	—	—	—	—	8,031 —
Ohio Field Office	—	—	—	—	—	—	—	—	5,317 —
Power Marketing Administrations	—	—	—	—	—	—	—	—	532 —
Savannah River Operations Office	—	—	—	—	—	—	—	—	3,000 —
Washington, DC	16,441	187	4,073	3,491	24,192	260	93	—	2,000 —
Total, Chief Financial Officer	16,441	187	4,073	3,491	24,192	260	93	—	22,826 a/ —
Policy and Program Evaluation									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	95	— —
Chicago Operations Office	—	—	—	—	—	—	—	695	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	201	— —
Ohio Field Office	—	—	—	—	—	—	—	364	— —
Richland Operations Office	—	—	—	—	—	—	—	245	— —
Washington, DC	14,672	537	—	3,145	18,354	183	100	5,300	— —
Total, Policy and Program Evaluation	14,672	537	—	3,145	18,354	183	100	6,900	— —
Congressional, Public & Intergovernmental Affairs									
Departmental Administration									
Washington, DC	8,063	120	—	1,856	10,039	110	91	90	— —
General Counsel									
Departmental Administration									
Washington, DC	14,870	136	1,035	2,836	18,877	172	110	—	— —
Economic Impact and Diversity									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	90	— —
Chicago Operations Office	—	—	—	—	—	—	—	480	— —
Golden Field Office	—	—	—	—	—	—	—	200	— —

a/ Funded through Cost of Work for Others in the Departmental Administration account

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources	
Oak Ridge Operations Office	—	—	—	—	—	—	—	403	—	—
Ohio Field Office	—	—	—	—	—	—	—	54	—	—
Washington, DC	3,575	96	—	693	4,364	51	86	1,673	—	—
Total, Economic Impact and Diversity	3,575	96	—	693	4,364	51	86	2,900	—	—
Office of Secretary										
Departmental Administration										
Washington, DC	2,143	307	—	50	2,500	24	104	—	—	—
Office of Inspector General										
Inspector General										
Albuquerque Operations Office	2,948	—	—	25	2,973	39 a/	76	—	—	—
Chicago Operations Office	906	—	—	8	914	12 b/	76	—	—	—
Idaho Operations Office	680	—	—	6	686	9	76	—	—	—
Nevada Operations Office	453	—	—	4	457	6	76	—	—	—
New Orleans	453	—	—	4	457	6	76	—	—	—
Oak Ridge Operations Office	1,286	—	—	11	1,297	17	76	—	—	—
Oakland Operations Office	680	—	—	6	686	9 c/	76	—	—	—
Ohio Field Office	2,800	—	—	24	2,824	37	76	—	—	—
Pittsburgh Energy Technology Center	907	—	—	8	915	12	76	—	—	—
Power Marketing Administrations	832	—	—	7	839	11 d/	76	—	—	—
Richland Operations Office	985	—	—	8	993	13	76	—	—	—
Savannah River Operations Office	1,361	—	—	11	1,372	18	76	—	—	—
Washington, DC	12,399	—	—	1,704	14,103	165	85	—	—	—
Total, Office of Inspector General	26,690	—	—	1,826	28,516	354	81	—	—	—
Board of Contract Appeals										
Departmental Administration										
Washington, DC	557	6	—	6	569	6	95	—	—	—
Field Operations										
Energy Supply Research and Development										
Chicago Operations Office	18,504	660	2,379	4,567	26,110	296	88	—	—	—
Idaho Operations Office	8,631	376	—	10,999	20,006	153	131	—	—	—
Oak Ridge Operations Office	13,689	360	50	7,074	21,173	233	91	—	—	—
Ohio Field Office	22,156	342	3,519	7,513	33,530	388	86	—	—	—
Washington, DC	6,251	250	3,494	2,101	12,096	68	178	—	—	—
Total, Field Operations	69,231	1,988	9,442	32,254	112,915	1,138	99	—	—	—
Total, FY 1996	1,148,059	69,142	380,578	242,653	1,840,432	15,795 e/	117	16,756,784	919,028	278,807

a/ Thirty three FTEs are located at the Albuquerque Ops Office six are located at Los Alamos National Lab

b/ Six FTEs are located at the Chicago Ops Office six are located at the Princeton Plasma Physics Lab

c/ All seventeen FTEs are located at Lawrence Livermore National Lab

d/ Nine FTEs are located at WAPA two are located at Bonneville PMA

e/ Does not include 1 453 FTEs authorized for the Federal Energy Regulatory Commission

FY 1996 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources	
Summary by Appropriation										
Energy Supply Research and Development	170,482	7,320	12,735	51,061	241,598	2,242	108	2,097,062	30,000	—
Uranium Supply and Enrichment Activities	3,175	439	—	1,399	5,013	51	98	84,887	—	—
General Science and Research	7,940	567	604	1,539	10,650	92	116	971,500	—	—
Weapons Activities	157,166	17,368	98,130	54,269	326,933	2,126	154	3,340,049	—	—
Defense Environmental Rest. & Waste Mgmt.	255,016	13,863	157,850	47,022	473,751	3,258	145	5,407,353	617,802	278,807
Other Defense Activities	68,088	4,721	30,634	17,573	121,016	773	157	1,335,374	—	—
Departmental Administration	114,644	3,139	34,088	39,571	191,442	1,648	116	10,890	22,826	—
Inspector General	26,690	—	—	1,826	28,516	354	81	—	—	—
Alaska Power Administration	2,474	261	296	177	3,208	35	92	1,052	—	—
Bonneville Power Administration	212,000	11,000	20,000	—	243,000	3,272	74	3,081,000	—	—
Southeastern Power Admunistration	2,458	246	103	665	3,472	41	85	26,430	—	—
Southwestern Power Administration	13,294	1,005	2,009	1,432	17,740	195	91	13,008	—	—
Western Area Power Administration	78,355	7,504	14,223	17,580	117,662	1,252	94	163,570	—	—
Colorado River Basin Fund	14,420	1,048	9,906	1,736	27,110	208	130	102,304	—	—
Nuclear Waste Disposal Fund	21,857	661	—	6,803	29,321	248	118	122,305	248,400	—
Total, FY 1996	1,148,059	69,142	380,578	242,653	1,840,432	15,795	117	16,756,784	919,028	278,807
Summary by Site										
Albuquerque Operations Office	110,993	12,667	50,310	26,004	199,974	1,590	126	2,865,150	135,587	—
Chicago Operations Office	37,142	1,917	4,820	7,984	51,863	568	91	1,336,404	55,901	—
Dallas Support Office	—	—	—	—	—	—	—	—	—	—
Golden Field Office	1,795	300	—	747	2,842	22	129	138,647	281	—
Idaho Operations Office	32,973	1,374	3,141	13,587	51,075	449	114	587,801	16,058	—
Morgantown Energy Technology Center	1,200	94	1,144	20	2,458	14	176	77,368	—	—
Nevada Operations Office	35,873	1,664	15,249	8,048	60,834	499	122	319,068	28,664	—
New Orleans	453	—	—	4	457	6	76	—	—	—
Oak Ridge Operations Office	29,326	1,522	3,436	13,251	47,535	432	110	1,311,511	46,822	—
Oakland Operations Office	19,480	776	7,602	2,333	30,191	244	124	390,752	128,118	—
Ohio Field Office	54,015	2,137	7,443	16,366	79,961	858	93	1,187,529	199,058	236,807
Pittsburgh Energy Technology Center	5,915	142	625	646	7,328	89	82	352,070	—	—
Power Marketing Administrations	323,833	21,064	46,537	21,597	413,031	5,014	82	3,387,364	532	—
Richland Operations Office	44,830	1,419	25,648	12,986	84,883	563	151	1,456,991	87,839	—
Rocky Flats Field Office	23,664	1,438	22,508	1,218	48,828	290	168	587,622	—	—
Savannah River Operations Office	44,948	1,566	23,138	9,305	78,957	584	135	1,386,342	7,300	—
Schenectady Naval Reactors Office	4,220	80	—	400	4,700	68	69	272,580	—	—
Washington, DC	377,399	20,982	168,977	108,157	675,515	4,505	150	1,099,585	212,868	42,000
Total, FY 1996	1,148,059	69,142	380,578	242,653	1,840,432	15,795	117	16,756,784	919,028	278,807

FY 1997 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Energy Efficiency & Renewable Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	46,973	— —
Chicago Operations Office	—	—	—	—	—	—	—	8,145	— —
Golden Field Office	1,450	225	—	1,000	2,675	16	167	206,516	— —
Idaho Operations Office	144	11	—	—	155	2	78	17,575	— —
Morgantown Energy Technology Center	—	—	—	—	—	—	—	1,000	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	1,200	— —
Ohio Field Office	—	—	—	—	—	—	—	15,626	— —
Richland Operations Office	—	—	—	—	—	—	—	800	— —
Washington, DC	10,826	455	150	3,481	14,912 a/	114	131	53,368	— —
Total, Energy Efficiency & Renewable Energy	12,420	691	150	4,481	17,742	132	134	351,203	— —
Nuclear Energy									
Energy Supply Research and Development									
Albuquerque Operations Office	130	5	—	—	135	1	135	21,910	— —
Chicago Operations Office	1,105	50	—	25	1,180	11	107	121,600	4,300 —
Idaho Operations Office	95	10	—	5	110	1	110	9,250	— —
Nevada Operations Office	—	—	—	—	—	—	—	1,085	— —
Oak Ridge Operations Office	330	30	—	40	400	2	200	15,935	— —
Oakland Operations Office	—	—	—	—	—	—	—	6,750	— —
Ohio Field Office	980	59	—	225	1,264	10	126	23,560	— —
Richland Operations Office	425	17	—	—	442	5	88	1,150	66,400 —
Savannah River Operations Office	—	—	—	—	—	—	—	700	— —
Washington, DC	11,110	534	1,217	3,688 b/	16,549	116	143	26,034	1,500 —
Total, Energy Supply Research and Development	14,175	705	1,217	3,983	20,080 c/	146 d/	138	227,974	72,200 e/ —
Uranium Supply and Enrichment Activities									
Chicago Operations Office	—	—	—	700	700 f/	—	—	2,160	— —
Nevada Operations Office	—	—	—	—	—	—	—	380	— —
Oak Ridge Operations Office	90	15	—	5	110	2	55	14,655	— —
Ohio Field Office	1,954	110	—	670	2,734	29	94	62,257	— —
Washington, DC	1,392	450	—	286	2,128	15	142	2,142	— —
Total, Uranium Supply and Enrichment Activities	3,436	575	—	1,661	5,672	46 d/	123	81,594	— —
Total, Nuclear Energy	17,611	1,280	1,217	5,644	25,752	192	134	309,568	72,200 —
Naval Reactors									
Other Defense Activities									
Idaho Operations Office	860	30	—	10	900	10	90	48,800	— —
Pittsburgh Energy Technology Center	4,870	100	—	630	5,600	74	76	333,200	— —
Schenectady Naval Reactors Office	4,300	80	—	320	4,700	67	70	261,700	— —
Washington, DC	7,090	480	—	132	7,702	58	133	1,330	— —
Total, Naval Reactors	17,120	690	—	1,092	18,902	209	90	645,030	— —
Civilian Radioactive Waste Management									
Nuclear Waste Disposal Fund									
Albuquerque Operations Office	—	—	—	—	—	—	—	9,185	13,600 —
Chicago Operations Office	—	—	—	—	—	—	—	546	— —

a/ Includes $441 000 of program direction included in the In-House Energy Management budget

b/ Working Capital Fund costs for all Headquarters NE staff are centrally managed in NE ESR&D account

c/ Includes $1 580 000 of program direction included in the Isotope Support budget

d/ Reflects authorized FTEs budget submission reflects end of year staffing

e/ Funded through the Other Defense Activities account

f/ $700 000 funds reimbursable work at New Brunswick Lab for measurement activities in support of Uranium programs

FY 1997 Department of Energy Program Direction

	Program Direction ($000)							Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs	Average Cost per FTE ($000)	Direct Approp	Other Funding Sources
Nevada Operations Office	10,582	331	—	3,800	14,713	119	124	23,174	35,082 —
Oak Ridge Operations Office	—	—	—	—	—	—	—	6,690	9,921 —
Ohio Field Office	—	—	—	—	—	—	—	290	— —
Richland Operations Office	75	12	—	—	87	1	87	100	— —
Washington, DC	12,492	275	—	2,942	15,709	110	143	129,534	141,397 —
Total, Civilian Radioactive Waste Management	23,149	618	—	6,742	30,509	230	133	169,519	200,000 [a] —
Alaska Power Administration									
Alaska Power Administration									
Power Marketing Administrations	2,446	198	451	905	4,000	34	118	—	— —
Bonneville Power Administration									
Bonneville Power Administration									
Power Marketing Administrations	217,000	12,000	22,000	—	251,000	3,272	77	3,109,000	— —
Southeastern Power Administration									
Southeastern Power Administration									
Power Marketing Administrations	2,562	195	103	1,129	3,989	40	100	23,456	— —
Southwestern Power Adminstration									
Southwestern Power Administration									
Power Marketing Administrations	13,378	1,044	2,009	1,431	17,862	192	93	9,942	— —
Western Power Administration									
Western Area Power Administration									
Power Marketing Administrations	73,079	7,341	13,564	15,044	109,028	1,190	92	143,437	— —
Colorado River Basin Fund									
Power Marketing Administrations	14,682	998	10,350	2,632	28,662	197	145	91,769	— —
Total, Western Power Administration	87,761	8,339	23,914	17,676	137,690	1,387	99	235,206	— —
Energy Research									
Energy Supply Research and Development									
Albuquerque Operations Office	—	—	—	—	—	—	—	102,213	— —
Chicago Operations Office	4,380	350	204	460	5,394	54	100	550,816	— —
Idaho Operations Office	—	—	—	—	—	—	—	10,057	— —
Oak Ridge Operations Office	165	15	—	59	239	2	120	314,797	— —
Ohio Field Office	—	—	—	—	—	—	—	181,372	— —
Richland Operations Office	—	—	—	—	—	—	—	115,521	— —
Savannah River Operations Office	—	—	—	—	—	—	—	975	— —
Washington, DC	26,635	1,500	2,370	6,016	36,521	254	144	221,527	— —
Total, Energy Supply Research and Development	31,180	1,865	2,574	6,535	42,154	310	136	1,497,278	— —
General Science and Research									
Albuquerque Operations Office	—	—	—	—	—	—	—	11,373	— —
Chicago Operations Office	1,595	63	135	87	1,880	18	104	575,808	— —
Idaho Operations Office	—	—	—	—	—	—	—	100	— —
Oak Ridge Operations Office	616	32	30	47	725	7	104	259,024	— —
Ohio Field Office	677	67	—	100	844	8	106	94,032	— —
Richland Operations Office	—	—	—	—	—	—	—	7,254	— —
Washington, DC	5,587	390	420	1,754	8,151	57	143	49,959	— —
Total, General Science and Research	8,475	552	585	1,988	11,600	90	129	997,550	— —
Total, Energy Research	39,655	2,417	3,159	8,523	53,754	400	134	2,494,828	— —

[a] Funded through the Defense Nuclear Waste Disposal account

FY 1997 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Science and Technical Information									
Energy Supply Research and Development									
Ohio Field Office	7,700	110	200	400	8,410	132	64	1,300	— —
Washington, DC	270	20	—	—	290	3	97	2,000	— —
Total, Science and Technical Information	7,970	130	200	400	8,700	135	64	3,300	— —
Defense Programs									
Weapons Activities									
Albuquerque Operations Office	88,790	9,757	47,205	24,209	169,961	1,234	129 a/	1,854,938	— —
Chicago Operations Office	—	—	—	—	—	—	—	3,456	— —
Idaho Operations Office	—	—	—	—	—	—	—	11,420	— —
Nevada Operations Office	20,333	1,045	13,650	3,137	38,165	285	134	197,700	— —
Oak Ridge Operations Office	6,680	770	900	4,655	13,005	80	163	427,726	— —
Oakland Operations Office	—	—	—	—	—	—	—	22,533	— —
Ohio Field Office	4,536	500	1,185	4,479	10,700	69	155	394,377	— —
Richland Operations Office	—	—	—	—	—	—	—	23,899	— —
Rocky Flats Field Office	—	—	—	—	—	—	—	48,000	— —
Savannah River Operations Office	1,445	75	402	133	2,055	18	114	103,400	— —
Washington, DC	39,453	3,700	34,788	22,577	100,518	311	323	288,149	— —
Total, Defense Programs	161,237	15,847	98,130	59,190	334,404	1,997	167	3,375,598	— —
Nonproliferation and National Security									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	229,336	— —
Chicago Operations Office	3,586	185	—	1,534	5,305	62	86	21,873	— —
Idaho Operations Office	—	—	—	—	—	—	—	5,372	— —
Nevada Operations Office	568	56	525	4	1,153	8	144	15,480	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	76,647	— —
Oakland Operations Office	—	—	—	—	—	—	—	878	— —
Ohio Field Office	—	—	—	—	—	—	—	33,383	— —
Pittsburgh Energy Technology Center	—	—	—	—	—	—	—	1,100	— —
Richland Operations Office	—	—	—	—	—	—	—	40,287	— —
Rocky Flats Field Office	—	—	—	—	—	—	—	900	— —
Savannah River Operations Office	—	—	—	—	—	—	—	4,645	— —
Schenectady Naval Reactors Office	—	—	—	—	—	—	—	500	— —
Washington, DC	37,671	2,459	32,889	16,145	89,164	353	253	60,949	— —
Total, Nonproliferation and National Security	41,825	2,700	33,414	17,683	95,622	423	226	491,350	— —
Fissile Materials Disposition									
Other Defense Activities									
Albuquerque Operations Office	—	—	—	—	—	—	—	29,900	— —
Chicago Operations Office	—	—	—	—	—	—	—	2,000	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	13,300	— —
Ohio Field Office	—	—	—	—	—	—	—	14,150	— —
Washington, DC	2,575	240	232	586	3,633	21	173	30,813	— —
Total, Fissile Materials Disposition	2,575	240	232	586	3,633	21	173	90,163	— —
Worker and Community Transition									
Other Defense Activities									
Washington, DC	2,066	75	2,000	200	4,341	16	271	62,659	— —
Total, Worker and Community Transition	2,066	75	2,000	200	4,341	16	271	62,659	— —

a/ Excludes $11,290,000 for Los Alamos Community Assistance Program reflected in Other Related Expenses

FY 1997 Department of Energy Program Direction

	Program Direction ($000)							Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs	Average Cost per FTE ($000)	Direct Approp.	Other Funding Sources
Environmental Management									
Defense Environmental Rest. & Waste Mgmt.									
Albuquerque Operations Office	20,402	1,640	2,759	1,029	25,830	247	105	445,842	100,093 ——
Chicago Operations Office	7,394	582	85	489	8,550	104	82	19,563	64,302 ——
Idaho Operations Office	22,274	881	1,897	2,357	27,409	259	106	455,807	18,001 ——
Morgantown Energy Technology Center	1,249	94	969	20	2,332	14	167	73,742	—— ——
Nevada Operations Office	4,590	216	757	1,932	7,495	60	125	74,436	—— ——
Oak Ridge Operations Office	6,328	282	1,479	1,296	9,385	80	117	64,169	47,208 ——
Oakland Operations Office	19,599	776	5,748	2,327	28,450	235	121	379,662	128,324 ——
Ohio Field Office	12,730	811	2,176	3,760	19,477	156	125	268,870	221,643 198,200
Pittsburgh Energy Technology Center	3,019	158	350	62	3,589	31	116	10,930	—— ——
Richland Operations Office	42,911	1,324	16,372	12,356	72,963	517	141	1,187,143	59,032 ——
Rocky Flats Field Office	24,310	1,419	17,313	1,201	44,243	286	155	507,404	—— ——
Savannah River Operations Office	41,784	1,417	14,681	8,649	66,531	521	128	1,108,090	4,300 ——
Washington, DC	59,020	4,078	55,070	12,089	130,257 a/	618	211	525,541	8,511 42,000
Total, Environmental Management	265,610	13,678	119,656	47,567	446,511	3,128	143	5,121,199	651,414 b/ 240,200 c/
Environment, Safety and Health									
Energy Supply Research and Development									
Albuquerque Operations Office	——	——	——	——	——	——	——	1,115	—— ——
Chicago Operations Office	——	——	——	——	——	——	——	5,965	—— ——
Idaho Operations Office	——	——	——	——	——	——	——	5,469	—— ——
Oak Ridge Operations Office	——	——	——	——	——	——	——	7,883	—— ——
Ohio Field Office	——	——	——	——	——	——	——	20,147	—— ——
Richland Operations Office	——	——	——	——	——	——	——	7,466	—— ——
Savannah River Operations Office	——	——	——	——	——	——	——	161	—— ——
Washington, DC	32,600	1,600	50	4,796 d/	39,046	316	124	24,954	—— ——
Total, Energy Supply Research and Development	32,600	1,600	50	4,796	39,046	316	124	73,160	—— ——
Other Defense Activities									
Albuquerque Operations Office	——	——	——	——	——	——	——	90	—— ——
Chicago Operations Office	——	——	——	——	——	——	——	1,567	—— ——
Idaho Operations Office	——	——	——	——	——	——	——	160	—— ——
Oak Ridge Operations Office	——	——	——	——	——	——	——	1,328	—— ——
Ohio Field Office	——	——	——	——	——	——	——	280	—— ——
Richland Operations Office	——	——	——	——	——	——	——	9,262	—— ——
Washington, DC	9,641	1,000	65	——	10,706	106	101	40,407	—— ——
Total, Other Defense Activities	9,641	1,000	65	——	10,706	106	101	53,094	—— ——
Total, Environment, Safety and Health	42,241	2,600	115	4,796	49,752	422	118	126,254	—— ——
Human Resources and Administration									
Departmental Administration									
Albuquerque Operations Office	——	——	——	——	——	——	——	50	—— ——
Idaho Operations Office	——	——	——	——	——	——	——	575	—— ——
Washington, DC	56,272	1,750	28,980	32,536	119,538	775	154	375	—— ——
Total, Human Resources and Administration	56,272	1,750	28,980	32,536	119,538	775	154	1,000	—— ——

a/ Includes $4 230 000 for the Technical Leadership Development Program and $8 104 000 for EM-wide buyouts

b/ Funded through the Energy Supply Research and Development account

c/ Funded through the Uranium Enrichment Decontamination and Decommissioning Fund account

d/ Working Capital Fund costs for all Headquarters EH staff are centrally managed in EH ESR&D account

FY 1997 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Chief Financial Officer									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	—	2,000 —
Chicago Operations Office	—	—	—	—	—	—	—	—	3,057 —
Idaho Operations Office	—	—	—	—	—	—	—	—	281 —
Oak Ridge Operations Office	—	—	—	—	—	—	—	—	14,335 —
Ohio Field Office	—	—	—	—	—	—	—	—	3,663 —
Savannah River Operations Office	—	—	—	—	—	—	—	—	3,000 —
Washington, DC	17,491	187	4,073	4,386	26,137	250	105	—	— 14,900
Total, Chief Financial Officer	17,491	187	4,073	4,386	26,137	250	105	—	26,336 a/ 14,900 b/
Policy and Program Evaluation									
Departmental Administration									
Washington, DC	15,843	537	—	3,821	20,201	172	117	8,421	— —
Congressional, Public & Intergovernmental Affairs									
Departmental Administration									
Washington, DC	9,029	120	—	1,975	11,124	99	112	105	— —
General Counsel									
Departmental Administration									
Washington, DC	16,434	136	1,255	3,012	20,837	178	117	—	— —
Economic Impact and Diversity									
Departmental Administration									
Albuquerque Operations Office	—	—	—	—	—	—	—	90	— —
Chicago Operations Office	—	—	—	—	—	—	—	480	— —
Golden Field Office	—	—	—	—	—	—	—	100	— —
Oak Ridge Operations Office	—	—	—	—	—	—	—	400	— —
Ohio Field Office	—	—	—	—	—	—	—	104	— —
Washington, DC	4,012	91	—	733	4,836	49	99	1,726	— —
Total, Economic Impact and Diversity	4,012	91	—	733	4,836	49	99	2,900	— —
Office of Secretary									
Departmental Administration									
Washington, DC	2,537	307	—	6	2,850	24	119	—	— —
Office of Inspector General									
Inspector General									
Albuquerque Operations Office	2,751	159	—	152	3,062	35 c/	87	—	— —
Chicago Operations Office	944	56	—	52	1,052	12 d/	88	—	— —
Idaho Operations Office	708	41	—	39	788	9	88	—	— —
Nevada Operations Office	472	28	—	26	526	6	88	—	— —
New Orleans	472	28	—	26	526	6	88	—	— —
Oak Ridge Operations Office	1,100	63	—	61	1,224	14 e/	87	—	— —
Oakland Operations Office	708	41	—	39	788	9	88	—	— —
Ohio Field Office	2,672	154	—	148	2,974	34	87	—	— —
Pittsburgh Energy Technology Center	943	54	—	53	1,050	12	88	—	— —

a/ Funded through Cost of Work for Others in the Departmental Administration account

b/ Funded through the Energy Supply, Research and Development account

c/ Thirty-one FTEs are located at the Albuquerque Ops Office: four are located at Los Alamos National Lab

d/ Six FTEs are located at the Chicago Ops Office; six are located at the Princeton Plasma Physics Lab

e/ All fourteen FTEs are located at Lawrence Livermore National Lab

FY 1997 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)		
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources	
Power Marketing Administrations	865	50	—	48	963	11 a/	88	—	—	—
Richland Operations Office	864	50	—	49	963	11	88	—	—	—
Savannah River Operations Office	1,337	78	—	74	1,489	17	88	—	—	—
Washington, DC	12,182	698	—	2,217	15,097	155	97	—	—	—
Total, Office of Inspector General	26,018	1,500	—	2,984	30,502	331	92	—	—	—
Board of Contract Appeals										
Departmental Administration										
Washington, DC	566	6	—	6	578	6	96	—	—	—
Field Operations										
Energy Supply Research and Development	19,392	660	2,379	4,846	27,277	273	100	—	—	—
Chicago Operations Office	10,426	376	—	11,109	21,911	138	159	—	—	—
Idaho Operations Office	15,505	360	50	7,334	23,249	216	108	—	—	—
Oak Ridge Operations Office	26,163	342	3,519	6,460	36,484	372	98	—	—	—
Ohio Field Office	6,736	255	3,494	2,317	12,802	66	194	—	—	—
Washington, DC	78,222	1,993	9,442	32,066	121,723	1,065	114	—	—	—
Total, Field Operations	1,183,050	69,369	350,500	259,570	1,862,489	15,179 b/	123	16,630,701	949,950	255,100
Total, FY 1997										

a/ Nine FTEs are located at WAPA, two are located at Bonneville PMA

b/ Does not include 1,483 FTEs authorized for the Federal Energy Regulatory Commission

FY 1997 Department of Energy Program Direction

	Program Direction ($000)						Average Cost per FTE ($000)	Additional Program Funding ($000)	
	Salary	Travel	Support Services	Other Related Expenses	Total	FTEs		Direct Approp.	Other Funding Sources
Summary by Appropriation									
Energy Supply Research and Development	176,567	6,984	13,633	52,261	249,445	2,104	119	2,152,915	72,200	—
Uranium Supply and Enrichment Activities	3,436	575	—	1,661	5,672	46	123	81,594	—	—
General Science and Research	8,475	552	585	1,988	11,600	90	129	997,550	—	—
Weapons Activities	161,237	15,847	98,130	59,190	334,404	1,997	167	3,375,598	—	—
Defense Environmental Rest. & Waste Mgmt.	265,610	13,678	119,656	47,567	446,511	3,128	143	5,121,199	651,414	240,200
Other Defense Activities	73,227	4,705	35,711	19,561	133,204	775	172	1,342,296	—	—
Departmental Administration	122,184	3,134	34,308	46,475	206,101	1,553	133	12,426	26,336	14,900
Inspector General	26,018	1,500	—	2,984	30,502	331	92	—	—	—
Alaska Power Administration	2,446	198	451	905	4,000	34	118	—	—	—
Bonneville Power Administration	217,000	12,000	22,000	—	251,000	3,272	77	3,109,000	—	—
Southeastern Power Administration	2,562	195	103	1,129	3,989	40	100	23,456	—	—
Southwestern Power Administration	13,378	1,044	2,009	1,431	17,862	192	93	9,942	—	—
Western Area Power Administration	73,079	7,341	13,564	15,044	109,028	1,190	92	143,437	—	—
Colorado River Basin Fund	14,682	998	10,350	2,632	28,662	197	145	91,769	—	—
Nuclear Waste Disposal Fund	23,149	618	—	6,742	30,509	230	133	169,519	200,000	—
Total, FY 1997	1,183,050	69,369	350,500	259,570	1,862,489	15,179	123	16,630,701	949,950	255,100
Summary by Site									
Albuquerque Operations Office	112,073	11,561	49,964	25,390	198,988	1,517	131	2,753,015	115,693	—
Chicago Operations Office	38,396	1,946	2,803	8,193	51,338	534	96	1,313,979	71,659	—
Dallas Support Office	—	—	—	—	—	—	—	—	—	—
Golden Field Office	1,450	225	—	1,000	2,675	16	167	206,616	—	—
Idaho Operations Office	34,507	1,349	1,897	13,520	51,273	419	122	564,585	18,282	—
Morgantown Energy Technology Center	1,249	94	969	20	2,332	14	167	74,742	—	—
Nevada Operations Office	36,545	1,676	14,932	8,899	62,052	478	130	312,255	35,082	—
New Orleans	472	28	—	26	526	6	88	—	—	—
Oak Ridge Operations Office	30,814	1,567	2,459	13,497	48,337	403	120	1,203,754	71,464	—
Oakland Operations Office	20,307	817	5,748	2,366	29,238	244	120	409,823	128,324	—
Ohio Field Office	57,412	2,153	7,080	16,242	82,887	810	102	1,109,748	225,306	198,200
Pittsburgh Energy Technology Center	8,832	312	350	745	10,239	117	88	345,230	—	—
Power Marketing Administrations	324,012	21,826	48,477	21,189	415,504	4,936	84	3,377,604	—	—
Richland Operations Office	44,275	1,403	16,372	12,405	74,455	534	139	1,392,882	125,432	—
Rocky Flats Field Office	24,310	1,419	17,313	1,201	44,243	286	155	556,304	—	—
Savannah River Operations Office	44,566	1,570	15,083	8,856	70,075	556	126	1,217,971	7,300	—
Schenectady Naval Reactors Office	4,300	80	—	320	4,700	67	70	262,200	—	—
Washington, DC	399,530	21,343	167,053	125,701	713,627	4,242	168	1,529,993	151,408	56,900
Total, FY 1997	1,183,050	69,369	350,500	259,570	1,862,489	15,179	123	16,630,701	949,950	255,100

Legislative Priorities

Mr. Myers. Please list your top legislative priorities. Also, please refer to the list of top legislative priorities identified by the Department last year and provide the status of each.

Secretary O'Leary. Our top legislative priorities for the Department for this session of Congress are:

- o extend and modify the authorities under the Energy Policy and Conservation Act to maintain and operate the Strategic Petroleum Reserve and to conduct activities related to the International Energy Agency (expire September 30, 1996); and

- o implement the President's budget request by:

  - reauthorizing through FY 1998 the Department of Energy program to remediate mill tailings at inactive uranium sites and nearby properties under the Uranium Mill Tailings Radiation Control Act (expires September 30, 1996);

  - clarifying existing authority to allow foreign governments to store their oil in unused storage capacity at the Strategic Petroleum Reserve;

  - refinancing the Bonneville Power Administration's outstanding Federal repayment obligation;

  - clarifying existing authority for private power plants on Government installations to sell excess electrical power off-site; and

  - authorizing a fee on foreign customers of Government uranium enrichment services similar to the fee paid by domestic purchasers.

The status of the Department's legislative priorities from the 1st Session of the 104th Congress is as follows:

- o extend and modify Strategic Petroleum Reserve and International Energy Agency authorities under the Energy Policy and Conservation Act, including providing for leasing excess SPR capacity (introduced in the Senate as S. 1605, not introduced in the House -- House Commerce Committee ordered reported on March 13, 1996, H.R. 2596, which would extend the authorities until the end of fiscal year 1998 but make no further modifications);

- o refinance the Bonneville Power Administration's outstanding Federal repayment obligation (passed by the Senate as part of its version of H.R. 3019, the Omnibus Consolidated Rescissions and Appropriations Act, Fiscal Year 1996, and now in conference; passed by House and Senate as part of H.R. 2491, the Balanced Budget Act of 1995, vetoed by the

- sell excess power off Federal sites (submitted to Congress on February 24, 1995).

In addition, during the last session of Congress we assigned priority to legislation that would:

- authorize the sale of the Alaska Power Administration and the export of oil from the Alaska North Slope (enacted as Public Law 104-58);

- authorize the sale of seven million barrels of oil from the Weeks Island Strategic Petroleum Reserves site (enacted as section 125 of Public Law 104-99);

- authorize the sale of Naval Petroleum Reserve Numbered 1 (enacted as title XXXIV of the National Defense Authorization Act of 1996 (Pub. L. No. 101-106));

- authorize the Administration to study and submit a plan to privatize the Southeastern, Southwestern, and Western Area Power Administrations (submitted to Congress on May 3, 1995);

- amend the Nuclear Waste Policy Act of 1982 to make additional funds available to the Department's civilian radioactive waste management program for site characterization at Yucca Mountain, Nevada (submitted to Congress on February 27, 1995);

- authorize the privatization of USEC; and

- transfer the Federal Energy Regulatory Commission outside the Department of Energy (submitted to Congress on October 23, 1995).

ACTIVITIES WITH RUSSIA AND THE NEWLY INDEPENDENT STATES

Mr. Myers Please identify all programs in the budget where funding is provided for activities with Russia or countries which were part of the former Soviet Union. Provide a brief description of the activity and funding for each activity for fiscal years 1995, 1996 and 1997.

Secretary O'Leary. Within **Defense Programs** there are several activities being carried out with Russia and other former Soviet Union countries. These activities can be broken down into the following five areas: nuclear weapon surety and control; nuclear materials protection, control, and accounting methods; scientific conversion of weapons technologies to civilian applications; physics and materials research under the interlaboratory partnering program; and international safety issues concerning production reactors. Funding for these activities are as follows:

ACTIVITY FUNDING
(in Thousands of Dollars)

	FY 1995	FY 1996	FY 1997
Weapon Surety and Control	$2,200	$2,700	$3,300
Material Protection, Control, and Accounting	420	0	0
Scientific Conversion	2,700	2,700	1,500
Interlaboratory Partnering Program	20	40	30
Reactor Safety Issues	50	50	50
Total	$5,390	$5,490	$4,880

The **Office of Environment, Safety and Health** has two programs with the former Soviet Union: the Chernobyl Health Studies and the Russian Federation Studies. The results of these studies are used to verify and update human radiation protection standards, and thereby reduce the uncertainty of risk associated with radiation health hazards to U.S. workers.

Studies that determine the radiation effects of the Chernobyl accidents include a study to determine risk estimates for thyroid cancer and other thyroid diseases as a function of dose in children exposed to radioactivity as a result of the Chernobyl accident. A research protocol for a study with approximately 15,000 subjects has been developed. A second study to determine the risk of thyroid cancer and other thyroid diseases in children as a function of dose. A long-term study with 70,000 cases has been developed. A third study to determine the risk of leukemia and

other related disorders in Chernobyl cleanup workers exposed to doses of radiation is being conducted.

Lastly, a fourth study to determine the risk of cataract development from radiation exposure is being conducted. It will supply the data necessary to determine the true potential for using cataract development as a tool to assess populations at risk and to help reduce uncertainties in retrospective dose reconstructions across populations. The specific purpose of this study is to obtain a reliable estimate of risk of cataract development in a dose-defined population involved in the Chernobyl accident.

The Russian Federation Studies are conducted under a bilateral agreement with Russia on radiation effects research signed October, 1994. Data related to workers and populations exposed to contaminations by the Soviet nuclear industry, including the world's most significantly contaminated areas in the Southern Urals, around the former nuclear weapons production plant "MAYAK," were recently declassified. The bilateral agreement, provides a framework for cooperative studies between the American and the Russian scientists aimed at determining the health effects of low dose, chronic exposure to radionuclides contamination

The initial goal is to study the feasibility of individual-dose reconstruction for the Urals population. A bilateral agreement to conduct this one year feasibility study was signed February 16, 1995. Specific activities of this initial study include preservation of the existing data base, verification of data, and design of a searchable database structure; calibration of a whole body counter; assessment of the feasibility of reconstructing doses for persons being studied; and establishment of models for sources and pathways of exposure for the Mayak region population.

Another study is Risk Estimation of the Stochastic, which are random effects in different individuals, Effects and the Results of Actual Observations of the Population Health in the Region of the Industrial Association "MAYAK." Activities for this study include examining the carcinogenic effects of chronic environmental radiation exposure; and evaluating cancer mortality in the Techa River study population. A different study is focused on the clinical, blood and tissue effects of radiation in the range of doses that can lead to deterministic effects. The MAYAK data will be critically reviewed and assessed for availability, suitability and adequacy.

Data from these studies will help us more effectively engage U.S. workers in cleanup of the U.S. nuclear weapons complex.

The cost for these activities are included in a chart that I would like to insert for the record. The information follows:

Funding ($ thousands)	FY 1995	FY 1996	FY 1997
Chernobyl	$ 2,025	$ 1,917	$ 1,500
Russian Studies	1,420	1,800	1,200
Total	$ 3,445	$ 3,717	$ 2,700

The attached list details all **Environmental Management** funding going to Russian institutes/activities in fiscal years 1995 and 1996. Most funding was provided under the auspices of the Memorandum of Cooperation between the Department of Energy, Office of Environmental Management, and the Ministry of Atomic Energy of the Russian Federation.

The projects involve the following technical areas: Contaminant Transport Modeling/Site Characterization, Decontamination and Decommissioning, Separations Technologies, Mixed Waste/Vitrification, and High-Level Waste Tank Retrieval. It is expected that the FY 1997 activities will be continued in these technical areas at the same level of effort.

FY 1995 PROJECTS (Dollars in Thousands)

Contaminant Transport Modeling/Site Characterization

- "Contaminant Migration Modeling of the Mayak Site", Mayak Production Association, Hydrospezgeologia $ 30
- "Contaminant Migration Modeling of the Tomsk Site", Hydrospezgeologia/ Siberian Chemical Combine 30
  TOTAL $ 60

Separations Technologies

- "Recovery of Cesium 137 from High-Level Waste by Sorption Technique with Copper Ferrocyanide", Institute of Physical Chemistry $ 16
- "Application of Extraction Technology Using Crown Ethers for Removal of Cesium from High-Level Waste on the Acid Side", Institute of Chemical Technology (Mamakin/Fryberger) 48
- "Research in the Field of Actinide and Technetium Redox Reactions and the Development of Techniques for their Stabilization in Specific Oxidation States in Alkaline Media, Institute of Physical Chemistry", 30
- "Co-precipitation of Actinides (IV), (V), (VI) from Alkaline Solutions, Institute of Physical Chemistry" 30
- "Determination of Hydroxo-Compounds of Np (IV)-(VI), PU (III)(VI), Am (III)-(IV), Tc (IV)(V) Solubility in 0.5-14 M NaOH, Institute of Physical Chemistry 30
- "Experimental Research Program on Applicability of the Russian Separation Technology to Processing of Defense High-Level Waste", Khlopin Radium Institute 200
- "Radiolysis of Actinides and Technetium in Alkaline Media,

Institute of Physical Chemistry"	35
TOTAL	$389

Mixed Waste Processing/Vitrification

o Thermodynamics of Low-Level Waste Melts, Institute of Silicate Chemistry	$ 35
o Application of Catalysts to Treatment of Off-Gases and Mixed Wastes, Boreskov Institute of Catalysis	50
o "Technology and Apparatus for Solidification of Radwaste by the Method of High Temperature Adsorption of Metals on Inorganic Matrices (silico-gel)", Institute of Chemical Technology	10
o "Recovery of Noble Metals from Complex Concentrates by Means of Continuous Countercurrent Metal Extraction in Induction Furnaces", Institute of Chemical Technology	20
o "Processing of Radioactive and Hazardous Wastes by Means of Melting in Induction Plasma Furnace", Institute of Chemical Technology	200
o Thermodynamics of Low-Level Waste melts, Institute of Silicate Chemistry	35
TOTAL	$350

High-Level Waste Tank Retrieval

o "Development of Equipment for Extraction of Radioactive Pulps and Cakes from Storage Facilities in Krasnoyarsk-26 and Hanford", Integrated Mining Chemical Company	$100
TOTAL	$100

Miscellaneous

o Paldiski Project: Supports environmental restoration of the Paldiski Nuclear Training Facility in Estonia.	$1,120
	$1,120
FY 1995 GRAND TOTAL	**$2,019**

FY 1996 ACTIVITIES (Dollars in Thousands):

Contaminant Transport/Site Characterization

o "Experimental Research Program on Multi-Packer Well Tests", Ecogeya	$100
o "Experimental Research Program on Mayak Contaminant Transport Modeling", Ecogeya	40
o "Experimental Research Program on Self-Cleansing of the Mishelyak River", Mayak Production Association	60
o "Experimental Research Program on Tomsk Contaminant Transport Modeling", VNIPIP	20
TOTAL	$220

Decontamination and Decommissioning

o "Cryogenic Technology and Development of Equipment for the Production of Granulated Materials", Institute for Chemical Technology	$10
o "Biotechnological decontamination of Open Ponds Contaminated by LLW", Khlopin Radium Institute	10
o "Use of Supercritical Fluid Extraction for Transplutonium Element Decontamination of Solid Materials", Khlopin Radium Institute	10
TOTAL	$30

Separations

o "Evaluation of Russian Liquid-Liquid Extraction Techniques Using Crown Ethers for Decontamination of Low- and High-Level Radioactive Wastes from Long-Lived Radionuclides and Toxic Metals", Institute of Chemical Technology	$ 50
o "Recovery of Cesium 137 from Actual INEL High-Level Waste by Sorption Technique with Copper Ferrocyanide", Institute of Physical Chemistry	15
o "Investigation on the Application of Homogeneous and Heterogeneous Catalysis for Alkaline Waste Treatment", Institute of Physical Chemistry	30
o "Investigation on the Removal of TRU from Alkaline Waste Solutions on Carriers Obtained by the Method of Appearing Reagents", Institute of Physical Chemistry	30

FY 1996 ACTIVITIES **(cont'd)**

o "Investigation on Disproportion of Plutonium (V) in Alkaline Media of Various Composition in Liquids and Model Sludge", Institute of Physical Chemistry	30
o "Investigation on Isolation of technetium from Alkaline Solutions", Institute of Physical Chemistry	30
o "Experimental Research Program on Application of the Russian Separation Technology to Processing of Defense High-Level Waste", Khlopin Radium Institute	200
TOTAL	$385

Mixed Waste/Vitrification

o "Pilot Scale Apparatus for treatment of Solid Mixed Radioactive Wastes: Plasmatron with Induction Cold Crucible Melter (PICCM)", Institute of Chemical Technology	$ 71
o "Experimental Investigation of Cold Crucible Technology Applications to Converting Mixed Low-Level Wastes into Stable Low Volume Glassy Slags", Khlopin Radium Institute	50
o "Assessment of Russian Waste Treatment Technologies and Their Applicability to US DOE Mixed Waste Focus Area Needs", Khlopin Radium Institute	20
TOTAL	$141

Miscellaneous

o Paldiski Project: Supports environmental restoration of the Paldiski Nuclear Training Facility in Estonia.	$880
TOTAL	$880

FY 1996 TOTAL FUNDING	**$1,656**

Energy Research information is provided for the record. All tabular funding is in Thousands of Dollars.

FUSION ENERGY SCIENCES

BILATERAL AGREEMENT

- The Memorandum of Cooperation (MOC) was signed in 1991 to advance research toward the development of fusion cooperative research. Exchange visits are carefully focused to achieve specific objectives and are parts of carefully-planned multi-year programs of cooperation.

- 1995 Program - over 60 activities/approximately 80 personnel (70% completed) - approximately $1M in incremental costs - travel

  1996 Program - over 40 activities/approximately 80 personnel (approximately 15% completed); dollars not available at this time

  1997 Program - not yet determined; program is likely to be at the same level as 1996 Program.

FY 1995	FY 1996	FY 1997
$1,000	--	--

INTERNATIONAL ENERGY AGENCY (IEA)

- The Russian Federation has now become an Associate Contracting Party to three IEA Implementing Agreements (Fusion Materials, Environment, Safety and Economics, and the Stellarator Concept) Formal procedures are now being completed for them to become an Associate Contracting Party to the IEA Fusion Nuclear Technology Agreement. Plans are now being developed to initiate work in FY 1997, but specific funding amounts have not been determined

INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR (ITER) ENGINEERING DESIGN ACTIVITIES (EDA) AGREEMENT - signed in July 1992 for six years

- The current phase of ITER, Engineering Design Activities, involves vigorous participation from the four Parties (the U.S., Russia, Japan and the European Union (EU)) as equal partners.

- The U.S. participation for ITER was $69M for 1995, $55M for 1996 and $55M is projected for 1997.

FY 1995	FY 1996	FY 1997
$69,000	$55,000	$55,000

INTERNATIONAL SCIENCE AND TECHNOLOGY CENTER (ISTC) IN MOSCOW

- The ISTC Governing Board, consisting of representatives from the U S , Japan, the European Union (EU) and the Russian Federation, has awarded about $3M of its own funding to the main fusion projects.

- The Governing Board of the ISTC, agreed at its June 1995 meeting in Moscow to provide $1M to Russian laboratories for a project to support the ITER design and research and development activities. The U.S., Japan and the EU equally shared the cost of the project, each providing from their contribution to the ISTC one-third of the $1M of funding. This project will provide Russian scientists and engineers who worked in the former Soviet Union's weapons of mass destruction programs an opportunity to redirect their talents to constructive, peaceful magnetic fusion research for ITER.

- Additionally, the Office of Fusion Energy Sciences (OFES) was the first U.S. agency to provide other than Nunn-Lugar monies to assure full funding of an ISTC project. The Governing Board of the ISTC approved $1M of funding to construct a fusion device called GLOBUS-M at the Ioffe Institute in St. Petersburg. The projected cost of the experiment is $1.5M, with OFES providing about $200K of program money in FY 1995 and the Ioffe Institute providing about $300K to complement the ISTC support.

FY 1995	FY 1996	FY 1997
$533	--	--

HIGH ENERGY PHYSICS

The High Energy Physics program is providing funding for two separate activities with Russia.

- Funding is being provided to a university based research group which is preparing an experiment to be performed at the UNK accelerator at Serpukhov, Russia.

FY 1995	FY 1996	FY 1997
$810	$762	$762

- Funding is also being provided as part of an Interlaboratory Collaborative Agreement between the Stanford Linear Accelerator Center and the Budker Institute for Nuclear Physics of the Academy of Science of Russia for work on magnets for the B-factory project at SLAC.

FY 1995	FY 1996	FY 1997
$ 58	$294	$ 0

NUCLEAR PHYSICS

A number of important joint scientific efforts have been supported by the ER Nuclear Physics Program involving scientists in Russia. The activities are listed, along with funding levels, in the table below.

- Participation in the Soviet American Gallium Experiment (SAGE) which measures solar neutrinos using a large liquid gallium metal detector in an underground mine in Russia

FY 1995	FY 1996	FY 1997
$600	$250	$ 20

- Participation of physicists at the Institute for High Energy Physics (IHEP) at Protvino, Russia in the design, development and fabrication of lead/scintillator calorimeter modules for the PHENIX detectors at the Relativistic Heavy Ion Collider (RHIC) under construction at Brookhaven National Laboratory.

FY 1995	FY 1996	FY 1997
$683	$877	$372

- Participation of physicists at the St. Petersburg Nuclear Physics Institute (PNPI) in the design, construction and testing of drift chambers for the PHENIX detector central tracking system for RHIC

FY 1995	FY 1996	FY 1997
$138	$206	$480

- Participation of physicists at the St. Petersburg Nuclear Physics Institute (PNPI) and the Efremov Institute in the fabrication of the PHENIX magnet steel structure for RHIC.

FY 1995	FY 1996	FY 1997
$454	$1,805	$ 0

- Participation of physicists at the Kurchatov Institute, Moscow in the installation of a Russian built array of 10,000 lead-glass modules, including phototubes, as part of the PHENIX detector at RHIC

FY 1995	FY 1996	FY 1997
$ 10	$ 10	$ 25

- Participation of physicists at the Institute for High Energy Physics (IHEP), Protvino in the design, development and testing of Electromagnetic Calorimeter modules for the STAR detector at RHIC.

FY 1995	FY 1996	FY 1997
$ 15	$ 15	$ 0

- Participation of physicists at the Moscow Engineering Physics Institute in the design, development and fabrication of components of the Time Projection Chamber (TPC) and the Silicon Vertex Tracker (SVT) for the STAR detector at RHIC.

FY 1995	FY 1996	FY 1997
$ 0	$ 21	$ 20

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

The Biological and Environmental Research program supports cooperative projects with Russia on Global Change and the Human Genome. The Global Change support falls within two areas: the Atmospheric Radiation Measurement and Global Change Data.

The Atmospheric Radiation Measurement Program, known as the ARM program, supports two peer reviewed research projects that are administered through Pacific Northwest National Laboratory.

- The first focuses on measurements and data analysis of solar scattering in the solar aureole in order to investigate aerosol optical depth and phase functions at the southern Great Plains ARM site from measurements at their institute in Moscow.

FY 1995	FY 1996	FY 1997
$ 45	$ 50	$ 50

- The second project seeks to further the understanding of radiative transfer in the presence of clouds with a random geometry, for example, partly cloudy sky) by developing stochastic descriptions of the interactions between the radiation and cloud fields and the testing of such approaches with real data from the ARM program.

FY 1995	FY 1996	FY 1997
$ 50	$100	$100

The increase in fiscal year 96 and fiscal year 97 reflects the addition of cloud radiation interactions appropriate to arctic regions.

- The Global Change Data Program provides continuing funding for meetings and travel for Working Group VIII under the USA-Russian Agreement on Cooperation in the Field of Protection of the Environment and Natural Resources Plan of Activities.

FY 1995	FY 1996	FY 1997
$ 34	$ 0	$ 30

- The Global Change Data Program also supports two projects at the Oak Ridge National Laboratory with all monies being budgeted for Oak Ridge personnel In fiscal year 95, a $25,000 project developed a bibliography on aerosols The second analyzed, documented, archived, disseminated, and translated Russian data sets.

FY 1995	FY 1996	FY19 97
$ 60	$ 60	$ 60

The Human Genome program sponsored two cooperative programs with Russia.

- The first consists of some 10-12 small projects with budgets between $5,000-30,000. The projects are administered through the Oak Ridge Institute for Science and Education and investigate topics of chromosome mapping, sequencing, specific disease genes, and related instrumentation.

FY 1995	FY 1996	FY 1997
$130	$ 90	$ 90

- The second is a project on DNA analysis. The agreement is between the Argonne National Laboratory and the Englehardt Institute in Moscow. Funding for the project is. fiscal year 95 - $4000,000, fiscal year 96 - $400,000, and fiscal year 97 - $400,000.

FY 1995	FY 1996	FY 1997
$400	$400	$400

Energy Efficiency and Renewable Energy. A secretarial Memorandum of Cooperation (MOC) was signed in October, 1993 with the Ministry of Fuels and Energy of the Russian Federation. Since then, DOE has provided resources to identify viable, cost-effective energy efficiency and renewable energy projects; identify sources of feasibility and project financing; and provide training to our Russian colleagues in such areas as business plan development and management Specific activities include a photovoltaic and wind energy system demonstration project in Fili Park, Moscow, and wind-diesel hybrid and biomass pilot projects to be built in regions without adequate heating resources.

The potential benefits from this MOC are great. Primarily, DOE's activities will help open the vast Russian market to the U.S. renewable energy industry. These exports will bring increased economic growth and jobs to the U.S. economy. The demand for renewable energy technology in the Russian Federation is driven in part by the energy shortages that country experiences during the heating seasons, as well as the desire to improve environmental and health conditions.

An example of success: In July 1995, a business plan training workshop was held in Washington, D.C. Eight Russian company representatives attended and completed business plans for submission to financial institutions and U.S. industry. At least one of these projects, involving construction of a geothermal plant in the Kamchatka region, has already begun Phase I and has attracted interest from EBRD and the IFC for feasibility studies for later phases.

Funds have been allocated for the Russian renewable energy program primarily out of the Office of Utility Technologies photovoltaic, bio power and wind programs, most of which are spent in the United States (funding in thousands of dollars):

FY 1995	$425
FY 1996	$315
FY 1997 (est.)	$250

Of the FY 1995 funds, 25% was allocated to the Intersolarcenter in Moscow, on a subcontract basis, matched 2 for 1 by the Intersolarcenter. The funds were used to collaborate with the National Renewable Energy Laboratory in selecting five sites in Russia's Northwest Territories for electrification, using wind-diesel hybrid systems and biomass power generation.

Of the FY 1996 funds, 10% is being allocated for management training of six staff from the Intersolarcenter and for purchasing photovoltaic panels from Sovlux in Moscow for a demonstration project. Sovlux is a joint venture between Russia's KVANT organization and Energy Conversion Devices of the United States.

The following table represents programs in the **Nonproliferation and National Security** budget where funding is provided for activities with Russia or countries which were a part of the former Soviet Union.

Office of Nonproliferation and National Security
Dollars in Thousands

	FY 1995	FY 1996	FY 1997
Export Control			
Department of Energy (DOE)	1,698	2,107	3,292
Department of Defense (DOD)	820	522	132
Department of State (State)	0	600	75
Subtotal	2,518	3,229	3,499
International Safeguards			
DOE	11,050	0	0
DOD	66,900	0	0
Subtotal	77,950	0	0
RERTR			
DOE	0	90	40
State	0	360	460
Subtotal	0	450	500
MPC&A			
DOE	0	68,815	92,637
DOD	0*	15,340	0
Subtotal	0	84,155	92,637
IPP			
DOE	0	10,000	15,000
DOD	0	10,000**	0
Subtotal	0	20,000**	15,000
Analytical Support			
DOE	2,766	4,013	3,060
DOD	0	0	0
State	0	0	0
Subtotal	2,766	4,013	3,060
TOTAL DOE	**15,514**	**85,026**	**114,030**
TOTAL DOD	67,760	25,862**	132
TOTAL State	0	960	535
GRAND TOTAL	83,274	111,848**	114,697

* In FY 1995 and prior years, the Department of Defense, under the Cooperative Threat Reduction Program, provided the majority of the MPC&A funding. Due to the Department of Energy's budget structure, this funding was reflected under the "International Safeguards" prior to FY 1996.

** Department of Defense may provide additional $10 million to the Industrial Partnering Program in FY 1996.

Under the Department of Energy's (DOE) Materials Protection, Control and Accounting (MPC&A) Program of Cooperation with the States of the former Soviet Union (FSU), the Department provides assistance in implementing enhanced material protection, control, and accounting at numerous FSU facilities which use or store special nuclear material, and provides technical support including training and equipment to national authorities and individual facilities and locations

Through the Industrial Partnering Program the Department attempts to redirect the activities of scientists and engineers from the Newly Independent States (NIS) to nonmilitary scientific and commercial research and development (R&D), provide business education and assistance to the commercial R&D projects, and support a partnership between DOE laboratories and NIS institutes to increase U S industry involvement

Export Control assists the FSU in developing or enhancing robust export control systems, including asserting appropriate controls of nuclear and nuclear-related materials, commodities, and equipment DOE export control activities include laboratory-to-laboratory programs which are in place in Russia and underway in Kazakstan and Ukraine, nonproliferation and export control workshops, FSU Graduate Student Facilitator Programs designed for U S graduate students to assist FSU governments in implementing effective export control systems, regular technical exchanges between U S and FSU technical experts, and assistance in FSU development of Export Information Systems for nuclear and nuclear-related dual-use material, commodities, and equipment

Analytical Support is the mechanism by which technical experts from the national laboratories are brought into the program to identify and evaluate transparency activities to provide confidence that highly enriched uranium (HEU) is, in fact, being down blended at the Russian facilities that process the HEU

Finally, the Reduced Enrichment for Research and Test Reactor (RERTR) program supports the U S government policy to reduce and eventually eliminate international civil commerce in highly enriched uranium The goal of this multi-faceted program is to enable and encourage the conversion of research reactors from highly enriched to low enriched uranium fuels The main scientific efforts of this program have been to develop high density LEU fuels that "mimic" the behavior of highly enriched uranium and fuels, and to modify research reactors to make use of these new fuels Incentives offered to reactors to convert have included acceptance of spent nuclear fuel containing uranium enriched in the United States and technical support for reactor conversions

The **Office of Nuclear Energy, Science, and Technology** supports the following Russian/former Soviet Union programs (Dollars in Thousands)

Program	FY 1995	FY 1996	FY 1997
International Nuclear Safety and Chornobyl Initiative	64,000 a/	48,100 b/	66,200
Nuclear Security/Russian Production Reactor Shutdown	3,000 c/	1,200 d/ g/	6,000
Nuclear Technology R&D (U S International Nuclear Safety Center)	5,000	0 e/	5,000
Transparency Measures	7,900 f/	7,500 f/	15,000 f/
TOTAL	$79,900	$56,800	$92,200

a/ Includes $3 6 million of reimbursable funding and $60 4 million of transferred funding from U S AID
b/ Includes $2 7 million of reimbursable funding and $15 4 million of anticipated transfer of funds from U.S. AID
c/ Funded from Department of Energy accounts - $1 million from nuclear security (NN), $1 million from international cooperation account within NE, and $1 million from the Department's prior year general carry-over funds
d/ Funding anticipated from the U.S. Department of State's Nonproliferation and Disarmament funds Negotiations with State are underway for an additional $800k
e/ Funded under International Nuclear Safety and Chornobyl Initiatives ($2.1 million)
f/ Includes other expenses funded under the Program Direction account for Uranium Programs
g/ Additional resources are being sought from DOD Nunn-Lugar funds

The International Nuclear Safety and Chornobyl Initiative program is designed to reduce the national security and safety threats posed by the operation of Soviet-designed nuclear reactors The goals of this program are to improve nuclear safety worldwide, particularly the safety of Soviet-designed nuclear powerplants, secure shutdown of the Chornobyl nuclear power plant, and develop and maintain at DOE core competencies in the area of nuclear safety

The Nuclear Security/Russian Production Reactor Shutdown program is designed to reduce threats posed by the continued operation of reactors that produce weapons materials, and to promote management practices that minimize the risks of proliferation of weapons-usable nuclear materials Specific activities include: preparatory work for conversion of fuel in Russian production reactors and identifying replacement

options, expansion of nuclear safety and nonproliferation cooperation with international agencies and foreign countries, addressing safety and nonproliferation concerns associated with breeder reactors in the former Soviet Union; and addressing spent fuel management concerns in Russia.

The Nuclear Technology R&D program provides funding in FY 1995 and FY 1997 to support the U S International Nuclear Safety Center In FY 1996 this activity is funded in the International Nuclear Safety/Chornobyl Initiatives program The U S International Nuclear Safety Center provides cooperative research and development programs, information exchanges, computer modeling, and other activities to help maintain core competencies in nuclear safety. Only a small part of this effort is devoted to activities with Russia and the former Soviet Union

The Transparency Measures program involves activities to increase U.S. confidence that Russian low enriched uranium being purchased by the United States Enrichment Corporation is derived from Russian highly enriched uranium in accordance with governmental agreements signed in February 1993 Specific activities include special monitoring visits to Russian uranium processing facilities and two continuous presence monitoring offices at the Russian facilities and support of the joint U.S /Russian Transparency Review Committee that develops transparency policy and negotiates the details of monitoring access

Mr. Myers. In business around the world, advances in technology, computers, and production techniques have lead to reduced labor and infrastructure costs. Do you have specific examples where use of advanced technology has reduced cost of government programs conducted by DOE or its contractors?

Secretary O'Leary. One of the Department of Energy's best examples of using advanced technology to reduce the cost of government programs is in the cleanup of DOE's former weapons production facilities.

In this area, the Department of Energy is both a developer and user of advanced technology. The estimated cost for stabilizing and cleaning up DOE's weapons production facilities is approximately $200 billion, with a range of $170 to $350 billion. The Department's Environmental Management program conducts research and development activities to develop new or improved technologies to reduce risks, cleanup costs, and/or provide cleanup methods that do not currently exist. Use of innovative cleanup technologies has already saved several hundreds of millions of dollars.

For example, the ResonantSonic™ Drilling, an innovative drilling technology that increases drill penetration in difficult geologic media and reduces drilling wastes, was used at Hanford last year, where it achieved greater than 25 percent cost savings over baseline methods. Dynamic Underground Stripping, a method to clean up hazardous underground fuel and solvent contamination, cost $13.8 million to develop and saved $19 million over conventional methods at one site at the Lawrence Livermore National Laboratory alone. Also, on a competitive bid on a waste stream (M-area Basin) remediation, the Minimum Additive Waste Stabilization (MAWS) was bid 40 percent below the cost of the base technology (grout). And the Expedited Site Characterization process to be implemented at Pantex and the Savannah River Site has shown cost savings of greater than 50 percent when compared to traditional sampling methods.

Furthermore, the Department is currently evaluating 37 newly developed cleanup systems for their cost savings potential. Early results show that, if aggressively implemented, the potential savings from these 37 technology systems is $15 billion to 20 billion of the projected cost of cleanup.

Mr. Myers. The Department of Energy should have access to research being conducted throughout the country in universities and other research centers. Is it possible for DOE to contract out for specific research conducted throughout this country and the world without investing in infrastructure and people which are needed for only one task and which subsequently limit DOE by tying up resources in outmoded facilities and staff resources?

Secretary O'Leary. Yes. Not only is it possible for DOE to contract out for specific research, we do it all the time. One of our guiding principles is that the Department invest in the most effective R&D performer for the research activities required. As determined by DOE program and management reviews, both universities and private sector companies are selected. Universities are often selected for basic research that can be conducted by individual and small groups of investigators. Industry is often selected for the development of specific technologies.

The Department's laboratories are selected for work requiring unique capabilities, or those requiring a high degree of security, large scientific facilities unavailable at universities or industry, research needing multi-disciplinary expertise, or mission driven research with urgently needed results unavailable from other R&D performers.

In addition, the distribution among R&D performed at DOE laboratories, universities, and the private sector varies substantially from mission area to mission area. The Department of Energy's recently released draft Strategic Laboratory Missions Plan addressed the issue of how four of the five Department mission areas influence who performs the R&D. In Figure 1 of the draft report, the breakdown by performer was for the Energy Resources Mission, 58% with industry, 37% with the DOE Laboratories, and 5% with the universities. For the the Science (and Technology) Mission, 73% was with the DOE Laboratories, 24% with the universities, and 3% with industry. For the National Security Mission, 50% was with the DOE Laboratories and 50% was with the Non-Laboratory Weapons Production Complex. For the Environmental Quality Mission, 81% was with Non-Laboratory Environmental Management Complex, 13% was with the DOE Laboratories, environmental restoration & waste management, 6% was with the DOE Laboratories, technology development, and less than 1% was with the universities.

In conclusion, the Department of Energy will continue to employ the most effective R&D performer for each of its mission-driven research activities, sourced from a robust array of public and private scientific and technical expertise.

BOOKS FOR SOUTH AFRICA

Mr. Myers. On the Secretary's trip to South Africa, how many DOE sites contributed books to donate and how many books were contributed by each contractor at each site?

Secretary O'Leary The Books for South Africa project was an initiative sponsored by Blacks in Government and the Child Development Center at Headquarters, both non-Government funded programs. The book campaign was aimed at individuals, rather than offices or contractor sites, and information concerning donations by DOE sites is unavailable since the contributions were voluntarily made by individuals, not by sites.

Mr. Myers. Is it true that one contractor bought books to donate to the program and then sought reimbursement by the federal government for the cost of the books? How was this resolved?

Secretary O'Leary. I am unable to confirm that one contractor bought books to donate and then sought reimbursement by the federal government. To the best of my knowledge, all books sent to South Africa were personally donated by generous individuals, both within and outside the federal government.

TRAVEL

Mr. Myers. Your statement notes that a reduction of $40 million in travel is forecast for fiscal year 1996. Please provide the basis for this calculation using object class information provided in the President's budget appendix.

Secretary O'Leary. The Department's Travel Savings Initiative, part of the Strategic Alignment Initiative, affects only those parts of the Department that were to remain under the Strategic Alignment plan. Therefore, all travel costs from the Power marketing Administrations and the Federal Energy Regulatory Commission are excluded. Further, the savings initiatives include the Department's contractor community, which are not included in the Object Class information presented. The $40 million sited is based upon the travel plans submitted by each element within the Department and each contractor. A mid-year review is currently underway to ensure that we are still on track to meet the plan's savings. We expect the results of that review to be available by the end of April.

GENERAL

Mr. Myers. For each Department of Energy laboratory and facility which uses laboratory directed research and development funding, provide a brief description and amount of funding for each task funded in fiscal years 1994, 1995, and proposed for 1996. Include the total amount of LDRD funding used each year at each laboratory.

Secretary O'Leary. The detailed information concerning the Department's laboratory directed research and development is shown in the attached listings of projects for each of the ten multiprogram national laboratories, which I would like to insert into the record. In addition, the total amounts of LDRD funding used by the laboratories in fiscal years 1994 and 1995 and projected for 1996 are shown in the table below, which I would also like to insert into the record:

LABORATORY DIRECTED RESEARCH AND DEVELOPMENT (LDRD)
(in Millions of Dollars)

National Laboratory	FY 1994	FY 1995	FY 1996
Ames	0.3	0.3	0.3
Argonne	11.9	13.6	13.6
Brookhaven	2.3	2.5	3.0
Idaho Engineering	10.8	14.7	13.8
Lawrence Berkeley	5.2	6.4	5.2
Lawrence Livermore	52.0	50.9	49.1
Los Alamos	63.5	60.8	54.3
Oak Ridge	9.9	12.7	12.5
Pacific Northwest	13.7	14.9	13.6
Sandia	60.2	67.9	67.5
Total	229.8	244.7	232.9

Ames Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

AMES LABORATORY LDRD FUNDING FOR FY 1994, 1995, 1996
(Funding in $K)

Project No.	Project Title	FY 94	FY 95	FY 96
93-04	Microstructural Control of Metallic and Ceramic Ceramic Powders Processed by Gas Atomization	30.0	0	0
93-10	Surface Modification of Vanadium Alloys for Use as Hydrogen Permeability Membranes	25.5	0	0
93-11	Characterization of Advanced Materials Using Ultrasonic Pulse Compression Technique (Phase II)	30.0	0	0
94-01	Potential Energy Surfaces and Dynamics for Reactions of Transition Metal Atoms, Ions and Clusters	31.0	0	0
94-02	Development of a Cyclic Process for Oxidation of Calcium Sulfide	17.5	0	0
94-03	Physics and Chemistry of NiTi Shape Memory Alloys as Materials for Implants	35.0	0	0
94-04	Atomistic Modeling of Polymers and Biomolecules Using Tight-Binding Molecular Dynamics	22.5	4.0	0
94-05	Plasma Spray Application of HIP Encapsulation	27.5	0	0
94-06	Environmental Monitoring of Sulfate Reducing Bacteria in Biocorrosion	19.0	0	0
94-07	In-situ Strengthening of Titanium with Yttrium	7.0	0	0
94-08	Massively Parallel Computational Simulation of Granular Media Micro-Mechanics for Material Process Development	17.0	10.0	0
94-09	Thermomechanical Properties of Ternary Silicides	18.0	30.0	0
94-10	Development of a Rotating Source Crossed-Molecular Beam Apparatus	0	41.0	31.0
95-01	Photocatalytic Oxidation of Organic Compound	0	21.3	16.3
95-02	Integrated Gasification/Fuel Cell Power System	0	24.0	16.5
95-03	Metal Injection Molding of HPGA from Aluminide Powder	0	27.5	0
95-04	Agile Radio Frequency Control for NMR Measurement of Vortex Motions in High Temperature Superconductors	0	29.5	6.0
95-05	Room Temperature Advanced Rare-Earth Rich Magnetic Materials	0	27.0	27.5

AMES LABORATORY LDRD FUNDING FOR FY 1994, 1995, 1996
(Funding in $K)

(Continued)

Project No.	Project Title	FY 94	FY 95	FY 96
95-06	Restrospective Waste Site Performance Evaluation by Tree-Ring Analysis	0	39.0	0
96-07	Low Pressure Electrothermal Vaporization Source for Environmental Analysis	0	21.0	0
95-08	Surface Properties of Quasicrystals	0	11.0	21.0
95-09	Determination of the Role of Minor Elements in the Distribution of Carbides in High Strength Steels	0	17.0	6.0
96-01	New Hydrophobic Clays for Sorption of Organic Contaminants	0	0	15.0
96-02	Co-Processing Swine Manure with Coal to Produce Usable Liquid and Gaseous Byproducts	0	0	14.5
96-03	Evanescent-Wave Fiber-Optic Cavity Ring-Down Spectroscopy	0	0	32.0
96-04	Applications of *Ab Initio* Spin Dynamics	0	0	27.0
96-05	Quasicrystal Hydrides: A New Class of Materials. An NMR Study of ^1H in QC-H_x	0	0	12.0
96-06	Electrochemically Transformable Extraction Phases for the Separation of the Critical Metal Ion Constituents in High Level Wastes	0	0	10.0
96-07	New Amorphous Magnetic Fibers for Highly Energy Efficient Soft Magnetic Cores	0	0	20.0
96-08	Oxidative Protection Coatings on C–C Composites	0	0	15.0
	Totals	280.0	302.3	269.8

Argonne National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
A	92-022	Feasibility Study for the Intense Pulsed Neutron Source Upgrade	586,500		
A	92-162	Investigation of Novel Detectors for Ultra-Fast Time-Resolved Studies	147,400		
A	92-182	Feasibility Study for the Target Stations for the Intense Pulsed Neutron Source Upgrade	213,900	202,600	
A	93-151	Millimeter Wave Linac and Undulator Development Using Microfabrication Techniques	207,300	216,100	
A	94-001	Amorphous Silicon Sensors: A New Detector Technology	141,200	189,300	
A	94-057	Development of Basic Concepts and Components for the Acceleration of Radioactive Beams	187,200	296,500	300,000
A	94-144	Short Wavelength Pulsed Magnetic Undulator Development Using Microfabrication Techniques	69,400	114,200	155,000
A	94-191	In-Situ Surface Monitoring System for Synchrotron Optics in High Heat Load Environment	84,000	122,800	130,000
A	94-192	Development of Focusing Optics and Detectors for Inelastic Scattering having a Resolution of 0.2 eV	57,500		
A	95-001	Rapidly Cycling Synchrotron Performance Optimization		619,100	600,000
A	95-271	Booster Target Studies for the Intense Pulsed Neutron Source		203,100	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
A	96-036	Development of an Isobar Tagger for Use with the ATLAS Fragment Mass Analyzer and Future Radioactive Beam Facilities			65,000
A	96-041	Novel Laser Doppler Angular Encoder for High Speed Nanopositioning			100,000
A	96-062	A Novel High-Current, High-Brightness H^- (D^-) Ion Source for Advanced Accelerator Applications			75,000
A	96-081	Near Detector for the MINOS Experiment			75,000
A	96-101	Development of Limited Streamer Tube Technology for MINOS (Main Injector Neutrino Oscillation Search)			100,000
A	96-107	Prototype Calorimeter for ATLAS Detector at CERN LHC			100,000
A	96-194	Slow-Positron Source			194,000
A	96-195	Investigation of Microstrip Gas Detectors for X-Ray Time-Resolved Studies			170,000
A	96-197	Integrated mm-Wave rf Amplifiers and Electron Linac Structures using LIGA Micromachining Techniques			185,000
A	96-200	Cathode Follower Amplifier Test on the IPNS Rapid Cycling Synchrotron			52,000
B	93-002	Design of New Devices for Production of Elliptically Polarized X-rays for the Basic Energy Sciences Synchrotron Radiation Center	248,600		

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
B	93-003	Development of Small Angle Scattering and Anomalous Small Angle Scattering Techniques	202,000		
B	93-004	Absorption, Fluorescence and Coincidence Experiments Using Synchrotron Radiation	353,100	257,900	
B	93-007	Development and Characterization of Transition Metal Cluster Beams for X-Ray Absorption Studies	98,800	92,500	
B	93-041	Development of Synchrotron Radiation Analytical Capabilities at the Center for Advanced Microstructures and Devices	223,600	343,100	150,000
B	93-150	Novel Application of Undulator Radiation: Holography, Intensity Interferometry, and Speckle	81,500	130,300	
B	93-152	Development of Interferometer-Based Fourier Transform X-Ray Techniques	150,700	148,600	
B	94-142	Inelastic X-Ray Scattering Studies Using High and Ultra High Energy Resolution	198,800	150,400	150,000
B	94-193	Development of X-Ray Scattering Techniques with μeV-meV Resolution	84,500	136,600	180,000
B	95-003	High Power X-ray Induced Modification of Materials		43,300	19,000
B	95-006	Development of Cryogenically Cooled Monochromator Crystals for an APS Undulator-A Beamline		220,900	200,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
B	95-007	Development of a Monochromator System for the BESSRC X-Ray Beamlines at the APS		200,900	150,000
B	95-012	New Synchrotron Anomalous Scattering Techniques		130,400	100,000
B	95-013	Optical Luminescence X-Ray Absorption Fine Structure: A New Method to Probe the Coordination and Valence of f-Elements in Amorphous Materials		81,500	50,000
B	95-171	Development of a Fast Spectrometer for Studying X-ray Induced Processes		56,300	
B	96-042	Development of X-Ray Waveguide Techniques for Studying Liquids in Confined Geometries			75,000
B	96-109	Time-Resolved Molecular Structures of Photogenerated Ion Pairs for Energy Conversion and Storage Using X-Ray Absorption			130,000
B	96-114	Structural Dynamics of Photochemical Systems in Liquids and Frozen Glasses Measured by Anomalous X-Ray Scattering			50,000
B	96-191	Development of X-Ray Heterodyne Correlation Spectroscopy and Phase-Sensitive Small Angle X-Ray Scattering Using Interferometric Methods			140,000
B	96-192	Development of X-Ray Intensity Fluctuation Spectroscopy for Study of Atomic-Scale Equilibrium Dynamics with Coherent X-Rays			130,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
B	96-312	Inner-Shell Atomic Structure and Dynamics with High-Energy X-Rays from the APS			260,000
B	96-313	The Production of Continuous Beams of Transition Metal Clusters for Studies at the APS			50,000
C	92-047	Computer Imaging of EBR-II Fuel Handling Equipment	170,000		
C	93-040	Laser Based Hot Cell Elemental and Isotopic Analysis System	124,400	132,500	
C	93-043	Implement Reliability Centered Maintenance and Condition Monitoring at the ANL-W Site	225,200	223,900	
C	93-047	Online IFR Fuel Burnup Determination via Stable-Gas Mass Spectrometry	190,200		
C	94-002	Neural Networks for Automated Fuel Manufacturing and Reprocessing	111,600		
C	94-015	Development of Real Time X-Ray Examination for Hot Cell Applications	111,300	99,900	
C	94-046	Sodium Imaging System (SIS)	89,700	152,300	
C	94-112	New Method for Separation of Plutonium from Plutonium-Gallium Alloys	212,200		
C	94-114	Weapons Plutonium Disposition - An Evaluation of Fuel Cycle and Technology Options	314,700	148,800	
C	94-186	Preconceptual Design of a Preprocessing Facility for IFR-based Recycle of Spent Nuclear Fuel	371,800		

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
C	94-187	Nuclear Decontamination and Decommissioning Cutting Technology Development	226,000	201,700	200,000
C	95-027	Use of Spent Experimental EBR-II Fuels to address Potential Materials Problems under Dry Storage Conditions		215,200	
C	95-030	Development of Analytical Methods to Perform Waste Characterization of Activated Metals		198,900	150,000
C	95-037	Investigation of Fast Neutron Radiography		35,700	
C	95-040	Optimization of Fuel Handling and Processing at ANL-W		158,200	
C	95-041	Utilization of Waste Hardware		239,900	240,000
C	95-049	Hydroclones for Removal of Suspended Material from Fused Salts		298,600	
C	95-054	Removal of Lithium Oxide and Lithium from Lithium Chloride-Based Process Salts		294,400	
C	95-061	Preconceptual Design of a Facility for Conditioning Spent Nuclear Fuel Using Pyroprocess		297,200	
C	95-221	Alkali Metal Laser Doppler Velocimetry		57,100	
C	95-280	Engineering Evaluation of Utilization of ANL-W Facilities to Support Boron Neutron Capture Therapy (BNCT)		25,000	200,000
C	96-202	Predictive Maintenance Research			90,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
C	96-203	Standard Test Method Development for Waste Forms			250,000
C	96-204	Precipitation of Metal Nitrides from Chloride Melts			195,000
C	96-208	Enhanced End Effector Control of Telerobotic Manipulators for Improved Spent Fuel Handling			176,000
C	96-210	EXAFS Investigation of Transmutation Effects on Waste Form Stability			100,000
C	96-212	Nuclear Criticality of Fissionable Materials in the High-Level Waste Repository			92,000
D	92-023	Innovative Theoretical Studies in the Solid State	175,200		
D	94-032	Interpreting Crack Propagation in Critical Components of Mechanized Systems	160,800	137,500	141,000
D	94-053	Compton Scattering from Ferromagnets Using Synchrotron Radiation	205,800		
D	94-055	New Materials Synthesis Strategies for High Temperature Superconductors Composed of Cu-O Planes Separated by Silicate-Based Layers	155,100	25,200	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
D	94-058	X-Ray Synchrotron Radiation Systems of Semiconductor/Semiconductor Heterophase Epitaxy	209,500	142,500	100,000
D	94-059	X-ray-Standing-Wave Studies of Buried Electrified Interfaces	88,900		
D	94-060	Investigations of Time-Resolved and Anomalous SAXS Studies for Critical Problems in Advanced Materials Research	56,300	57,900	
D	94-103	Development of a Code for Simulating Welding Processes	218,400	131,000	100,000
D	94-133	Dynamic Laser Cladding	181,300		
D	94-165	Development and Applications of Novel Biomimetic TiO_2 Photocatalysts for Selective Heavy Metals Removal	176,900	149,500	140,000
D	94-169	Plasma Modification and Characterization to Improve Micromanufacturing and Etching Technology	162,400	141,400	70,000
D	94-179	Application of Advanced Materials and Methods to Cermet Gas Sensor Development	140,200	136,400	140,000
D	94-182	Removal of Contaminant Cu from Remelted Steel Scrap	144,400	148,200	
D	95-020	Development of Laser Technology for the Decontamination of Surfaces		207,100	
D	95-062	Development and Testing of a Simulation System to Assess and Predict the Structural Properties of Welds		172,600	200,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
D	95-063	Modeling and Applications of Composite Structures		188,000	200,000
D	95-160	Plasma Synthesis of Novel Catalysts		75,200	
D	95-162	Ion-Specific Sensors Based on Conductive Organic Polymers		79,900	60,000
D	95-163	Use of Self-Assembled Monolayers as Templates for Growth of Novel Microporous Molecular Sieve Films		73,700	
D	95-178	High Critical Currents and Patterning by Splayed and Columnar Defects in Superconductors		77,900	
D	95-182	Synthesis and Characterization of Nanocrystalline Barium Titanate		75,400	
D	95-184	Exploratory Development of Sulfide Fiber Glass Mat		74,300	
D	95-196	Feasibility Studies in Application of Phosphate Based Composites for Light Weight Construction Materials		72,200	
D	95-253	Applications of Nanoparticle Technology to the Development of a New Class of Energy-Efficient Industrial Heat Transfer Fluids		100,500	140,000
D	95-260	Development of Smooth Diamond Films for Cost-Effective Machining and Wear Applications		100,000	140,000
D	95-305	Theory of Macroscopic Quantum Phenomena and Disordered Materials		53,300	60,000
D	96-001	Novel Molecular Rulers for Advanced Manufacturing Processes			75,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
D	96-009	Exploratory Research of Novel Oxygen-Ion Conducting Structures			75,000
D	96-018	Magneto-Optical Imaging of Current Distributions in Josephson Junctions			75,000
D	96-023	Shape and Function Selective Molecular Receptors for Advanced Sensors			75,000
D	96-024	Modification of Catalyst Pores for Low Density Separations			75,000
D	96-193	Temperature Compensation of Permanent Magnets			75,000
D	96-196	Development of Micromachining Technique Based on Deep-Etch X-Ray Lithography			150,000
D	96-199	Vacuum Chambers of Composite Materials			120,000
D	96-207	Development and Validation of Atomizer Model for Analysis of Spray Forming Manufacturing			122,000
D	96-256	Exploratory Development of High Power Density Ultracapacitors			190,000
D	96-257	Micromachining Technology - Intelligent Microsensor Fabrication			185,000
E	94-047	2D-3D/Holographic Images and Virtual Reality Projections for Control Room/ Simulator Designs	179,800	193,100	
E	94-054	Large-Scale Wavelet-Based Signal Processing	160,600	168,000	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
E	94-190	Integrating MultiMedia with High Performance Computing and Communications	158,900	140,800	
E	94-194	A Development of Numerical Codes for Electronic Structure Calculations for Electronic of Molecules of Biological Interest	125,100		
E	95-010	CAVE Virtual Environment Technology Development		176,300	200,000
E	95-070	A Human-Computer Expert System for Automated Highway System		198,000	200,000
E	95-072	Recurrent Artificial Neural Networks for Modeling of Nonlinear Systems		173,000	169,000
E	95-167	Optimization Methods for Macromolecular Conformation on High-Performance Architectures		68,400	70,000
E	95-241	Improved Fuel Injector Spray Modeling for Internal Combustion Simulation		74,200	
E	95-247	Artificial Intelligence Applied to Adaptive Mesh Refinement for Nonlinear Finite Element Analysis		74,200	
E	95-269	Computer Aided Drug Design Using Virtual Reality		99,700	100,000
E	95-279	Evaluation of the ANL ICRKFLO Code for Simulation of a Commercial-Scale Fluid Catalytic Cracker (FCC) System		42,100	
E	96-037	Ab Initio Characterization of a Model Catalytic HDS Process			75,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
E	96-106	Enabling Technologies for Internetworked Applications			200,000
E	96-190	Advanced Computer Network Development			175,000
E	96-211	An Expert System Simulator (ESS) for the Manufacturing Industry			75,000
F	92-108	Structural Biology and the Human Genome: Crystal Structures of PNA	290,400	188,600	110,000
F	92-160	Design Enzymes for Efficient and Effective Conversion of Biomass into Chemical Feed Stock and for Other Industrial Applications	239,700		
F	92-180	Molecular Biology And Biotechnology of Hyperthermophilic Organisms: The Chaperone Release Factor	296,000	92,400	
F	93-090	Advanced Molecular Dynamics Methods, Protein Folding Simulations and Crystallographic Structure Refinement	270,800	162,600	
F	93-097	The Role of 3D Molecular Structure in Energy Transduction as Probed w/Site Direction	14,400		
F	95-011	Time Domain Molecular Structure Determination for Metastable Reaction Intermediates in Photochemical Processes Using X-Ray Absorption		140,600	
F	95-164	Reconstructing Metabolic Function from Genome Sequence Data		70,400	75,000
F	95-176	Solution Structures of GroEL and GroES Complexes with Proteins		75,600	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
F	95-183	Structure-Function Characterizations of Protein Regulators of Programmed Cell Death		75,200	
F	95-270	Lipogenin, A Potential Human "Hormone" that Acts as a General Inducer of Lipid Formation		124,000	300,000
F	96-004	Interactions of Molecules Involved in Cell Death			75,000
F	96-031	Investigation of a New Site for Herbicide Action in Green Plants			75,000
F	96-308	Biodemography: An Application to Human Life Expectancy			45,000
F	96-310	Gene Expression Modulated by Amenothiols in Radiation Protection and Chemoprevention			50,000
G	91-034	Remote Sensing and Global Change	105,700	116,300	
G	93-156	National Earth Monitoring Data Repository	143,700		
G	94-106	Coupled Optimization/Groundwater Modeling Techniques for the Design of Groundwater Remediation Systems	106,600		
G	94-154	Detection of Global Change (Long Term Trends and Episodic Behavior in the Atmospheric Temperature Profile)	184,200		
G	94-157	Regional Climate Forcing in Mixed Land-Lake Regions	144,900		

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
G	95-272	Three-Dimensional Real-Time Imaging of the Planetary Boundary Layer on Watershed Scales		39,100	465,000
G	96-002	Stable Isotopic Investigations of the Chemical and Biological Degradation of Chlorinated Organic Solvents			75,000
G	96-012	Engineering Photochemistry for Novel Redox Reactions and Bioremediation			75,000
G	96-076	Tracking Atmospheric Aerosols with Natural Radioisotopes - 7Be and 210Pb			75,000
G	96-094	Development of a Volume-Imaging Sodar			75,000
G	96-206	Development of a No-Moving-Parts Fourier Transform Infrared (FTIR) Sensor using an Uncooled Micro-bolometer Focol Plane Array Detector			200,000
G	96-244	Applications of High Brilliance X-Ray Radiation from Synchrotron Sources to Environmental Science, Technology, and Management			200,000
G	96-255	Hyperspectral Remote Sensing for Environmental Remediation			130,000
G	96-306	An Integrated Environment to Support Bioremediation Studies			100,000
G	96-311	Environmental Management Scientific Research Initiative: Proof of Concept Research			250,000

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
H	93-094	NO_x Reduction in Diesel Engine Using a Nitrogen Plasma	201,000	140,500	
H	94-033	Liquid-Metal-Based Method for Disposal of Toxic Chemicals	87,200		
H	94-102	Millimeter-Wave Sensor for Monitoring	178,000		
H	94-115	Conditioning of N-Reactor Spent Fuel for Ultimate Disposal	191,000		
H	94-117	Molten-Salt TRU Extraction Process for Converting TRU Residues to Non-TRU Wastes	225,100		
H	94-118	Characterization of Metallic Fuel Alloys for Plutonium Destruction	175,800		
H	94-167	Waste Management of Chloro-fluorocarbons	133,600	137,500	
H	95-050	Development of Performance Assessment Capability for Waste Disposal		199,800	
H	95-051	Evaluation of TRU-Bearing Disposal Alloys		198,700	
H	95-071	Risk Evaluation of Nuclear Waste - Uncertainty and Sensitivity Analyses		180,200	200,000
H	95-075	New Technology for Removal of Heavy Noble Gases from Argon and from Air		244,300	
H	95-095	Beneficial Uses for Nuclear Waste		150,100	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECH AREA	PNUMBER	TITLE	FY94	FY95	FY96
H	95-217	Feasibility Study for the Development of a Miniature Rapid-Scan Passive Remote Fourier Transform Infrared (FTIR) Sensor		74,900	
H	95-229	Neural Network NO_x Emission Controller for Fossil Plants		74,600	
H	96-201	Soil Washing/Chemical Extraction to Remediate Lead Contaminated Soils at ANL-E Site 832			125,000
H	96-205	Metal Volatility in Waste Processes			300,000
H	96-254	Stabilization of Radionuclides in Ceramic Waste Forms by a Novel Electrochemical Approach			175,000
I	93-006	Excited State Atomic Structure Determination Using Synchrotron Radiation	192,500		
I	93-091	Laser-Induced Transient Gratings	91,800		
I	94-003	Intelligent Robotics Glove	129,400	118,400	
I	94-056	Long Baseline Neutrino Oscillation Experiment	158,500		
I	94-168	A Computer Simulation of an Intelligent Vehicle Highway System for the Chicago Metropolitan Area	123,100	139,700	70,000
I	95-159	Ultrapurification of Tungsten Hexafluoride for Semiconductor Use		72,700	
I	95-170	Nucleon Amplitudes in QCD		59,400	
I	95-191	Near-Field Scanning Optical Microscopy		73,800	

Argonne National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

TECHAREA	PNUMBER	TITLE	FY94	FY95	FY96
I	95-265	High-Sensitivity Infrared Chemical Sensor Development		104,600	140,000
I	96-007	Zeolite-Based Catalyst Structures for Direct Methanol Fuel Cells			75,000
I	96-103	Feasibility of Microwave Stabilization of a High Energy Pulsed Power Supply That Can be Used for A Sub-Picosecond Pulse Radiolysis Facility			100,000
I	96-305	Coherent Control of Molecular Physics and Chemistry			150,000
TOTALS:			$11,865,100	$13,617,200	$13,610,000

Technical Areas:

A - Advanced Accelerator and Detector Technology
B - X-Ray Techniques for Research in the Biological and Physical Sciences
C - Nuclear Technology
D - Materials Science and Technology
E - Computational Science and Technology
F - Biological Sciences
G - Environmental Science
H - Environmental Control and Waste Management Technology
I - Novel Concepts in Other Areas

Brookhaven National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Brookhaven National Laboratory
Laboratory Directed Research and Development
Fiscal Year 1994/1995/1996

Project Number	Project Title	Group	FY 1994	FY 1995	FY 1996
95-25	Magnetic Mapping of Rebars and Piping in Infrastructure Systems	1	$0	$99,829	$0
93-10	Calcification in Marine Alga: A Molecular Approach to a Major Pathway of Global Carbon Cycling	2	$60,515	$0	$0
94-10	Ozone depletion, chemistry and physics of stratospheric aerosols	2	$99,533	$103,757	$0
95-40	Atmospheric Degradation of Hologenated Compounds	2	$0	$94,245	$37,000
95-44	Extraction & Destruction of Hazardous & Toxic	2	$0	$75,555	$75,000
96-19	An Evaluation of the WSR-88D Radar for the	2	$0	$0	$80,000
96-42	Designer Polymers for Permeable Ground	2	$0	$0	$100,000
96-49	Autecology of the Peconic Bay Brown Tide Organism	2	$0	$0	$100,000
92-15	Studies on the Cellular Toxicity of Cocaine & Cocaethylene	3	$13,623	$0	$0
93-24	Development of Microdialysis Technology	3	$61,526	$0	$0
93-32	Analysis of structures and interactions of nucleic acids & proteins by small angle X-ray diffraction	3	$97,690	$47,579	$0
93-33	Enhancement of Microplaner Beam Radiation Therapy (MRT) of the Intracerebral Rat 9L Gliocarcoma by Preinfusion with a Diiodofluorecein-Histone Conjugate	3	$96,966	$0	$0
93-35	Relaxographic MRI and functional MRI	3	$93,408	$105,161	$0
94-03	Very low temperature infra-red laser absorption as a potential analytical tool	3	$57,142	$59,070	$0
94-37	Feasibility of SPECT in imaging of F-18 FDG Accumulation in Tumors	3	$15,806	$99,776	$110,000
94-42	Feasibility Studies for Establishing a Proton Facility for Cancer Therapy	3	$176,895	$0	$0
95-33	Low Dose Gamma Imaging Facility for In Vivo Molecular Medicine	3	$0	$109,736	$110,000
96-06	Positron Emission Magnetic Resonance Imaging (PEMRI)	3	$0	$0	$100,000

Brookhaven National Laboratory
Laboratory Directed Research and Development
Fiscal Year 1994/1995/1996

Project Number	Project Title	Group	FY 1994	FY 1995	FY 1996
96-38	BNCT for Leukemia Through Ex-Vivo Purging of Bone Marrow	3	$0	$0	$82,000
96-40	Initiation of MRI Studies in Human Subjects	3	$0	$0	$116,000
96-46	BNCT Treatment Planning Software Proposed Modifications	3	$0	$0	$100,000
91-21	Effect of Bacterial Spore Protein on Mutagenesis	4	$30,155	$0	$0
93-22	Genetics of Drug Addiction	4	$87,391	$0	$0
94-31	Understanding the molecular basis for the synthesis of plant fatty acids possessing unusual double bond positions	4	$64,808	$69,439	$0
94-32	Structure determination of outer surface proteins of the Lyme disease spirochete	4	$76,787	$81,508	$0
94-36	Development of the PCR-SSCP technique for the detection, at the single cell level, of specific genetic changes	4	$85,114	$88,141	$0
95-07	New Directions In In-Vitro Enzyme Mapping: Catechol-O-Methyltransferase	4	$0	$98,779	$103,000
95-13	Use of the Extreme Thermophilic Bacterum *Thermatoga Maritima* as a Source of Ribosomal Components and Translation Factors for Structural Studies	4	$0	$92,696	$98,000
95-15	Biochemical & Structural Studies of Chaperon Proteins from *Thermotoga Maritima*	4	$0	$75,762	$100,000
96-32	Methods for Detecting Activation of the DNA-Activated Protein Kinase, DNA-PK, in Human Tissue Culture Cell	4	$0	$0	$103,000
96-34	Enzymatic & Regulatory Interactions of a Single Protein with 3 Different Sites in Nucleic Acids	4	$0	$0	$113,000
96-48	Comparison of Mutations in Fish Melanomas with Human Melanomas	4	$0	$0	$105,000

Brookhaven National Laboratory
Laboratory Directed Research and Development
Fiscal Year 1994/1995/1996

Project Number	Project Title	Group	FY 1994	FY 1995	FY 1996
93-25	Investigation of the utility of max-entropy methods for the analysis of powder diffraction data	5	$73,342	$39,778	$0
93-30	Accelerator Technology	5	$249,900	$0	$0
94-05	State-resolved measurements of H2 photodesorption· Development of laser probes of H2 for in-situ accelerator measurements	5	$68,871	$77,222	$0
94-06	Siberian Snake Prototype Development for RHIC	5	$132,139	$133,591	$220,000
94-21	RF Sources for Linear Colliders	5	$97,788	$0	$0
94-33	Low Mass, Low Cost Multiwire Proportional Chambers for Muon Systems of Collider Experiments	5	$87,527	$85,717	$96,000
94-43	Visible Free Electron Laser Oscillator Experiment	5	$70,000	$100,008	$30,000
95-01	Study of possible 2+2 TeV Muon-Muon Collider	5	$0	$149,580	$200,000
95-03	Ultraviolet FEL R&D	5	$0	$100,005	$100,000
95-04	Precision Machining Using Hard X-rays	5	$0	$100,005	$100,000
95-10	Proposal to Develop a High Rate Muon Polarimeter	5	$0	$49,990	$0
95-11	Development of Intense, Tunable 20-Femtosecond Laser Systems	5	$0	$66,937	$65,000
95-45	Study of High Power Density Compact Target Design and Associated Moderators, Beam Ports and Shielding for a 5 MW Pulsed Spallation Neutron Source	5	$0	$100,004	$0
96-10	Coherent Synchrotron Radiation Experiment	5	$0	$0	$50,000
96-11	In-Vacuum Undulator (IVUN) for the NSLS X-ray Ring	5	$0	$0	$100,000
96-27	Tailored Pulse UV/XUV Photon Source Development	5	$0	$0	$72,000

Brookhaven National Laboratory
Laboratory Directed Research and Development
Fiscal Year 1994/1995/1996

Project Number	Project Title	Group	FY 1994	FY 1995	FY 1996
93-11	Structure-Sensitive Properties of Advanced Permanent Magnet Materials: Experiment and Theory	6	$105,710	$0	$0
93-20	A High Flux Neutron Source	6	$44,306	$0	$0
94-09	Synthesis and characterization of novel microporous solids	6	$113,862	$111,292	$0
94-26	Resonance Raman Detection of VOC's	6	$100,338	$0	$0
94-34	Theory of Self-Organized Criticality	6	$61,488	$62,532	$0
95-16	Spin Polarized Coincidence Spectroscopies	6	$0	$0	$78,000
96-22	Studies of Nano-scale Structural Defects and Transformation Using Advanced Electron Diffraction and Imaging Techniques	6	$0	$0	$105,000
96-26	Research into New Database Methodology Based on the Object Protocol Model	6	$0	$0	$75,000
96-37	Low Frequency Dynamics of Novel Materials	6	$0	$0	$77,000
	Fiscal Year Totals		**$2,322,630**	**$2,477,694**	**$3,000,000**

LEGEND
Group 1 - New Direction for Energy Technologies
Group 2 - Global Change
Group 3 - Radiation Therapies and Imaging
Group 4 - Genetic Studies
Group 5 - New Directions for the Development and Utilization of BNL Facilities
Group 6 - Other Miscellaneous

Idaho National Engineering Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
		AGRICULTURE AND NATURAL RESOURCE TECHNOLOGIES			
94	INELW412	Animal Tagging with Enhanced Technologies	$5		
94	INELW415	Transmitting Power Through Fiber Optic Cables	$9		
94	INELW423	Intelligent Farm Management System Pilot Project	$68		
94	INEL0301	Plant Embryo Growth Chamber	$66		
94	INEL0305	Microbiology of Sugar Plant Flume System	$10		
94	INEL0451	Microbe and Nutrient Delivery System	$22		
94	INEL1241	Mixed Microbial Fertilizer Amendments	$40		
94	INEL3107	Regional Position Sensing for Integrated Farm Management Systems	$30		
94	INEL3502	Agriculture Systems Analysis Research	$33		
94	INEL6111	Improved Transformation and Regeneration Techniques for Cotton	$33		
94	INEL6401	Environmentally Safe Seed Preparation	$36		
94	INEL6704	Model	$13		
94	INEL7602	Optimization of Agricultural Spray Nozzle Design	$54		
94	INEL8106	Rapid Agrochemical Sensor	$24		
94	INEL8604	Nitrate Sensor System for Screening and Monitoring Groundwater	$30		
		CHEMICAL AND MATERIALS TECHNOLOGY			
94	INELW206	HigherTRUs for Nuclear Propulsion	$10		
94	INELW404	Determination of Natural Iodine	$12		
94	INELW405	Improved Method for Strontium and Actinides in Fecal Material Using Lyophilization, Microwave Digestion, and Column Chromatography	$33		
94	INELW406	Development of Rapid Methods for the Determination of Plutonium, Uranium, Amencium, and Strontium in Urine Samples	$32		
94	INELW413	Petroleum Tanks Inspection System	$144		
94	INEL3106	Time	$27		
94	INEL3307	Deposition and Characterization of Magnetic Films	$23		
94	INEL3308	In Situ Characterization of Thermal Sprayed Coatings	$24		
94	INEL7503	Numerical Simulation of HVOF Spraying Processes	$45		
94	INEL7906	Application of Ultrasonics to Liquid Metal Measurements	$119		
94	INEL7907	Process Monitoring of Waste Using Prompt Gamma Neutron Activation Analysis	$52		
94	INEL8402	Biologically Derived Ceramic Materials	$43		
94	INEL8404	Development of Positron Annihilation Spectroscopy	$28		
94	INEL8503	Precision Reactive Thermal Spray System	$32		
94	INEL8505	Design Requirements Incorporating Fracture Mechanics for Metal-Matrix Composites	$32		
94	INEL8506	Micromechanical Analysis Capability for Composite Materials	$25		
94	INEL8507	Preforms	$38		
94	INEL8512	Advanced Metallic Alloys by Design for Corrosion Applications	$70		
94	INEL8605	Transport Properties in Polymeric Membrane	$71		
94	INEL8610	Superior New Phosphazene Polymers	$36		
94	INEL8614	Bond-Selective Electrosynthesis Process	$86		

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL8618	Carbon Fiber Composite In Situ Cure Sensor Utilizing Intelligent Process	$23		
94	INEL8703	Plasma Plume Monitor	$37		
94	INEL8708	Offline Manufacturing Simulation	$32		
94	INEL8709	Plasma Quench Reactor Modeling	$29		
94	INEL8712	Spray Forming of Titanium Alloys into Billet and Sheet	$44		
94	INEL8806	Industrially Compatible Laser Ultrasonics	$45		
94	INEL8807	Superplastic Forming Using High-Intensity Ultrasound	$34		
		DOE NUCLEAR MATERIALS ASSETS MANAGEMENT			
94	INEL0402	Development of a Comprehensive Planning Methodology to Assess the Environmental Health Risks from Power Plant Emissions	$30		
94	INEL7302	Fuel Cycle Study to Minimize Radioactive Waste, Maximize Resource Utilization, and Close the Fuel Cycle, Phase II	$60		
94	INEL7905	High-Sensitivity Nondestructive Assay for Transuranic Waste Characterization	$42		
94	INEL8105	Radiation Purification of Natural Waters	$23		
94	INEL8613	Tritium Removal from Contaminated Water	$59		
94	INEL9506	Evaluation of Options for Disposition of Nuclear Materials	$36		
		ENERGY EFFICIENCY AND RENEWABLE ENERGY			
94	INEL2202	Small, Portable Turbine Generator, Market Assessment	$7		
94	INEL2204	Survey of Energy System methodologies with Recommendations for a Standardized Evaluation Method	$45		
94	INEL3501	Modular Energy Systems Research	$87		
94	INEL4301	Flutter Windmill	$18		
94	INEL4303	TundraTran Parasitic Drive System	$8		
94	INEL5001	Development of an Accident Management Information System	$61		
94	INEL6102	Anadromous Fish Migration Enhancement	$34		
94	INEL7002	Development	$63		
94	INEL8501	Characterization of Aged Materials with NDE and Internal Friction measurements	$79		
94	INEL8510	Cooperative Industrial Research with GE Lighting Project	$36		
		ENGINEERED SYSTEMS			
94	INEL0730	A Complex-Wide Geographic Information System Metadata Clearing house	$48		
94	INEL3201	Unexploded Ordnance Detection and Locating	$53		
94	INEL3304	Rapid Three-Dimensional Prototyping Process	$48		
94	INEL3601	Transportation Network Software	$45		
94	INEL3701	FormBuilder	$36		
94	INEL3702	Data Stream Analyzer	$40		
94	INEL4302	Wireless Data Logging System	$27		
94	INEL6808	Compressed Gas Safety Valve	$29		
94	INEL8612	Desktop Manufacturing of Miniaturized Components	$23		

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL8713	Coupled Fluid/Structural Valve Dynamics Code	$7		
		ENVIRONMENTAL RESTORATION DECONTAMINATION AND WASTE TREATMENT			
94	INELW410	Screening Test to Determine Radioactive Contamination of Environmental Samples and Waste	$60		
94	INELW311	Micro Pipe Crawlers for Internal Characterizations for Small Diameters of Pipes	$6		
94	INELW316	Remote Subsurface Characterization System	$75		
94	INELW403	Flow-Through Electrodes for Analytical and Environmental Applications	$3		
94	INELW407	Development of a Miniature Autonomous Robot System	$53		
94	INELW409	Characterization of Fuel Processing/Waste Form Chemistry by High-Temperature Mass Spectrometry	$168		
94	INELW410	Development of Screening Test for the Simultaneous Determination of Alpha/Beta Radionuclides in Environmental Samples and Wastes	$48		
94	INELW411	Solid Phase Microextraction	$9		
94	INELW420	Autonomous Control System Research	$11		
94	INELWXX1	Investigation of Toxic Metals Separation from ICPP Sodium-Bearing Waste Using Molecular Recognition	$35		
94	INEL0101	Economic Enhanced Phytoremediation	$8		
94	INEL0103	Toxicological Assessment of Bi-Phasic Counter-Current Soil Treatment	$40		
94	INEL0303	Removal of Chlorinated Solvents from Air Streams Using Anaerobic Biofiltration	$42		
94	INEL0304	Removal of VOCs from Wood Drying and Composite Pressing Off-Gases by Biofiltration	$64		
94	INEL0306	Utilization of Sawdust for Microbial Abatement of Acid hline Drainage	$27		
94	INEL1000	Develop CERCLA Integrated Engineering Process	$35		
94	INEL1221	Constituent Interaction During Thermal Treatment of INEL Soils	$55		
94	INEL1222	Demonstration of Life-Cycle Assessment Methodology for an Innovative Environmental Remediation Technology	$54		
94	INEL1231	Bioconversion of Waste Gypsum	$50		
94	INEL1232	Process for Environmentally Compatible Removal of Organic Contaminants	$81		
94	INEL1240	Direct 5S rRNA Assay for Enhanced Bioprocessing and Environmental Monitoring	$55		
94	INEL1242	Biological Monitoring of Biological Systems	$30		
94	INEL3105	Improving the Effectiveness of the Removal of Contaminated Concrete Surfaces using Microwave Energy	$57		
94	INEL3306	Laser Detection of Heavy Metal Contamination	$50		
94	INEL3710	Photodissociation of Mercuric Chloride into Components Suitable for Recycling and/or Treatment - Preliminary Investigations for a Treatability Study	$22		
94	INEL4502	Improved Tapping Method for High-Temperature Metal or Slag Melters	$36		
94	INEL6402	Implications of Passive Venting of Contaminant Soil Vapors	$5		
94	INEL6403	Improved Plant Uptake of Radionuclides	$55		

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL6503	Nutrient Diffusing Substrata to Conduct Rational Bioremediation	$38		
94	INEL6701	Intermediate/Field-Scale Model for Predicting Microbial Transport	$28		
94	INEL6702	Estimating Sorption Properties of Clay Minerals	$26		
94	INEL6703	Down-Hole Gamma Spectroscopy for Real-Time Contaminant Monitoring	$29		
94	INEL6803	Deep Tensiometer	$12		
94	INEL6804	Development and Testing of a Fate and Transport Model Using Existing Petroleum Technology	$42		
94	INEL6805	Waste	$32		
94	INEL6806	Flow Regime Effects on In Situ Extraction of RCRA Metals from Mining Wastes	$35		
94	INEL6807	In Situ Sensors and Sampling Devices for Vadose Zone Monitoring	$27		
94	INEL6809	Microbiologically Enhanced In Situ Leach Mining of Copper Sulfide Ores	$23		
94	INEL6901	Innovative Geophysical Characterization for Evaluation of In Situ Fractures/Liquid Transport in Fractured Rock	$69		
94	INEL7001	Fabricate and Test Alpha Continuous Air Monitor	$47		
94	INEL8102	Gamma-Ray Destruction of CFCs/Halons	$22		
94	INEL8103	Rapid Characterization of Ore Surfaces and Cyanide Complexes Using SIMS	$34		
94	INEL8104	Real-Time Asbestos Analysis by Raman Spectroscopy	$23		
94	INEL8107	Minewater Processing Membrane Modules	$10		
94	INEL8201	Supercritical Water Oxidation Effluent Treatment Process Evaluation	$50		
94	INEL8403	In Situ Biodegradation of High-Energy Materials	$66		
94	INEL8509	Polyethylene Sulfur Cement: Feasibility as a Waste Encapsulation Material for Low Level Mixed Waste	$15		
94	INEL8609	Designer Alloys for Corrosion Resistance	$43		
94	INEL8615	Low-Temperature Reductive Catalytic Destruction of Hazardous and Environmentally Unfriendly Halogenated Organics	$51		
94	INEL8617	Application of a Supercritical Fluid Extraction Procedure for Radioactive Surface Decontamination	$35		
94	INEL8714	Sensing Techniques for Thermal Treatment of Mixed Waste	$12		
		GROUND TRANSPORTATION			
94	INEL7304/5	Transient Exhaust Heat Transfer and Fluid Mechanics	$92		
94	INEL0302	Treatment of Paint Room Off-Gases	$30		
94	INEL2301	Development of High-Energy Density Capacitors for Electric Vehicle Drive Trains	$47		
94	INEL3102	Automobile Collision Avoidance	$32		
94	INEL3104	Novel Radar Techniques for Nondestructive Evaluation of Subway Tunnels	$21		
94	INEL3309	Inspection of Rails	$2		
94	INEL3403	Application Enhancements for LAN-Oriented Video Conferencing	$28		
94	INEL4101	Practical, High-Efficiency Ericsson Cycle Engine	$46		
94	INEL4202	Real-Time Control of Thermal Spray Coating	$20		

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL4304	Automobile Night Vision System	$20		
94	INEL4501	Systems Analysis of a Solid-Oxide Fuel Cell for Light-Duty Vehicles	$34		
94	INEL7101	Hydrogen from Ammonia	$45		
94	INEL8504	Transportation Manufacturing Technology	$30		
94	INEL8805	Weight in Motion Sensor and Signal Analysis	$41		
94	INEL9101	Human Factors Issues for Resolving Adverse Effects of Human Workload Transitions in Advanced Transportation Systems	$37		
		MANUFACTURING TECHNOLOGIES			
94	INELW310	Infrared MicroAntenna Detector	$22		
		NATIONAL SECURITY/ARMS CONTROL			
94	INEL2101	Performance Testing of Tungsten UO for Bimodal Applications	$64		
94	INEL2203	Bimodal Space Solar Power and Propulsion Concept	$86		
94	INEL3202	Narcotic Vapor Flux Research	$23		
94	INEL3302	Advanced Bar Code (Holotag)	$56		
94	INEL3305	Snake Photon Imaging Through Clouds, Smoke, Dust, Haze, and Other Atmospheric Obscurants	$31		
94	INEL8101	Field Sampling and Preservation of Precursors and Degradation Products of	$25		
94	INEL8710	Plasma Destruction of Organic Liquid Wastes	$39		
94	INEL8711	Diamond Synthesis in a Thermal Plasma Fast Quench Reactor	$41		
		NUCLEAR REACTOR SERVICES			
94	INEL7102	Utilization of Nuclear Reactor Loop Out-Of-Pile System	$3		
94	INEL7103	Boiling Test Facility in the Advanced Test Reactor	$12		
94	INEL7104	Isotope Shuttle Irradiation System (ISIS) Systems Study	$74		
94	INEL7405	Dosimetry for Ultrahigh Flux Environments	$34		
94	INEL7902	ATRC Boiling Water Test	$50		
94	INEL7909	Tritium Production by Irradiation of 'He	$104		
		OIL AND GAS			
94	INEL3312	Noise Reduction Techniques for Digital Pressure	$0		
94	INEL3926	Advanced Manufacturing Technology for Solid Oxide Fuel Cells	$215		
94	INEL3940	Conversion of Natural Gas to High-Value Products Using a Plasma Fast Quench Reactor	$90		
94	INEL4201	Thermoacoustic Heat Pump Systems, Natural Gas Driven	$60		
94	INEL6504	Genetic Improvement of Methanol Production by Microorganisms	$45		
94	INEL7105	Internally Reforming SOFC Thermo-Chemical Modeling	$30		
94	INEL8511	Plant Life Extension by Characterization and NDE Sensing of Materials	$32		
94	INEL8611	Catalytic Conversion of Natural Gas to Useful Chemicals and Fuels	$36		
94	INEL8701	Plasma-Electrochemical Conversion of Methane to Alcohol - 11	$75		

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL8705	Submerged Arc Heavy Crude Oil, Residuum, and Natural Gas Co-Conversion, Economics II	$40		
94	INEL8808	High-Temperature Electromagnetic Acoustic Transducer	$19		
		REACTOR RESEARCH ANALYSIS AND TECHNOLOGY			
94	INEL5109	Tokamak Edge Plasma Physics Modeling in Support of ITER	$102		
94	INEL7201	Neutron Source Feasibility and Technology Transfer Studies for Boron Neutron Capture Therapy	$121		
94	INEL7402	Development of a General Geometry, Advanced Homogenization Code for Arbitrary Reactor Configurations, Phase Input Preprocessing and Depletion	$62		
94	INEL7403	Advanced Fuels for Weapons Material Disposition - Task 3. Actinide-Reduced Plutonium Fuel with Tungsten for Weapons Material Disposition	$112		
94	INEL7701	Horizontal Steam Generator Modeling using RELAP5/MOD3	$62		
94	INEL7801	Application of RELAP5 to Medical Diagnostics and Modeling of the Cardiovascular System	$49		
94	INEL9001	Variance Reduction Techniques for Dynamic Probabilistic Risk Assessment	$32		
94	INEL9503	Assessment of SCDAP/RELAP5/MOD3.1 for VVER-1000 and-410 Reactors	$31		
94	INEL9504	Computational Analysis of Ultrasound Transducers for Medical Imaging	$20		
94	INEL9507	Scaling Studies and Debris Coolability Experimental test Matrix	$59		
		SENSORS AND INSTRUMENTATION			
94	INELW311	Disposable Autonomous Robots for Characterization - A University-Directed Research Program	$20		
94	INELW317	Radio Control of Inspection Equipment and Vehicles	$9		
94	INELW414	Low-Level High-Precision Isotopic Measurements	$40		
94	INELW417	Robotic End Effector Positioning System	$73		
94	INELW418	Miniature Mecanum Wheeled Vehicle	$60		
94	INELW402	Electrocatalytic Vapor Sensor	$39		
		TEXTILES			
94	INEL1100	Sensor Determination of "Hand"	$10		
94	INEL2201	Optimization of an Industrial Process	$19		
94	INEL3310	Alternate Joining Techniques for Textiles	$9		
94	INEL3311	Moire Fabric Inspection Techniques	$12		
94	INEL8616	Supercritical Fluid Processing in the Textile Industry	$30		
94	INEL8809	Sensors for Detection of Polypropylene Contamination in Cotton and Wool	$20		
		UNKNOWN			
94	INELW315	Intense Accelerator-Produced Neutron Source	$79		
94	INELW416	Method of In Situ Generation of Gaseous Tritium Standards	$18		
94	INELWXX2	Mass Destruction	$0		
94	INEL0102	Assessment Methodology for Enhanced Bioremediation of Hydrocarbons in the Petroleum Industry	$39		

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
94	INEL2601	Biodiesel Optimization and Commercialization Analysis	$45		
94	INEL4010	Passive Biosorbents for Treaty Verification	$22		
94	INEL7303	Vanadium Recycling by Removal of Transmutation Products	$89		
94	INEL8619	Alternative Catalysts for Automotive Applications	$23		
		NATIONAL DERIVED USE AND TECHNOLOGY TRANSFER CENTER			
95	INEL0230	Nondestructive Examination of Bottom Crimped Seam on 55 Gallon Drums		$22	
95	INEL0231	High Tc Squid-Sensor NDE		$74	
95	INEL0232	Robust NDE using photorefractive nonlinear optics		$46	
95	INEL0248	Polymers - Water Separations, Ozone/Oxygen Separations, Platform, and Laser Assisted Polymerization		$186	
95	INEL0251	Iron Aluminide Filters for Improved Efficiency Fossil Energy Conversion		$31	
95	INEL0252	Wear Coatings for Aluminum Automobile Engine Components		$41	
95	INEL0253	Factors Which Determine the Microstructure of Spray Deposited Materials		$135	
95	INEL0305	Microbiology of Sugar Plant Flume Systems		$36	
95	INEL1206	Alkylation Catalysts for Operation at Supercritical Fluid Conditions		$82	
95	INEL1241	Amendments		$52	
95	INEL1301	Sensors for the Control of Thermal Spray Processes		$61	
95	INEL1302	Heat Transfer Through Solid Cryogen		$13	
95	INEL1303	Concentration Technologies		$20	
95	INEL2278	Site-Specific Technologies for Agriculture: Pilot Project		$296	
95	INEL2501	Development of Nondestructive Fatigue Monitor		$152	
95	INEL3302	Advanced Barcode (Holotag) Reader		$48	
95	INEL3601	Transportation Network Core Software		$72	
95	INEL3711	Optical Sensor Development for High Voltage Metering and Protection Applications		$77	
95	INEL4061	Development of Chemically Selective Surfaces for Adsorption and Detection of Gas-Phase Contaminants		$112	
95	INEL4073	Alloys by Design		$65	
95	INEL4076	Improved Process Control Thermocouples		$79	
95	INEL4080	National Infrastructure Renewal		$158	
95	INEL4081	Optical Measurement Technology		$162	
95	INEL4082	Velocity Sensor for Control of Thermal Spray		$74	
95	INEL4103	Hybrid Electric Vehicle Evaluation		$33	
95	INEL4105	Demand Side Management Control System for Electric Vehicles		$40	
95	INEL4151	Development of Intelligent Cooperative Miniature Robot Systems		$96	
95	INEL4157	Natural Gas Locomotives and Transportable Power		$83	
95	INEL4184	Loom Feedback Controls		$28	
95	INEL4203	Highly Dynamic Materials Process Modeling Using Particle Methods		$60	

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
95	INEL4205	Advanced Plasma Processes for Black Liquor Gasification		$80	
95	INEL4206	Joining and Testing of Small Scale Automotive Components		$71	
95	INEL4208	Process Control Development for Ultracapacitor electrodes by Liquid Injection Plasma Deposition (LIPD)		$74	
95	INEL4395	MAPS Solid Oxide Fuel Cell		$54	
95	INEL4396	MAPS Thermo Photovoltaic		$44	
95	INEL4468	Optimization Based SIMPLEV		$34	
95	INEL4469	Hybrid Vehicle Component Hardware-in-the-Loop Feasibility Study		$8	
95	INEL4470	Software Metrics Program		$99	
95	INEL4479	Manufacturing Research		$207	
95	INEL4480	Building Materials		$49	
95	INEL4481	Smart HVAC Systems Design		$46	
95	INEL4482	High Temperature Porous Cement Filters for the Paper and Pulp Industry		$50	
95	INEL4483	Silent Discharge Plasma for Treatment of Automobile Exhaust		$81	
95	INEL4485	Evaluation of Liquid Metal Technologies Applicable to Radioactively-Contaminated Scrap Metal (RSM) Recycling		$24	
95	INEL4486	INEL Metal Recycle: Induction Melting		$49	
95	INEL4487	Process Industries - Industrial Improvement Using Integrated Process Evaluation: Food Processing, Pulp and Paper, Steel/Aluminum		$127	
95	INEL4488	Depleted Uranium Flywheels for Stationary Applications		$33	
95	INEL4758	Simulation Based Prototyping for Manufacturing Based Engineering		$52	
95	INEL4759	Human and Organizational Systems Readiness		$75	
95	INEL4860	Butterfat Management		$96	
95	INEL4862	Advanced Process Diagnostics System		$44	
95	INEL4866	Miniature Tag and Covert Communicator		$94	
95	INEL4952	INEL Multimedia Object Database		$99	
95	INEL4953	General User Interface Development Environment		$73	
95	INEL4954	Intelligent Data Access and Retrieval System		$154	
95	INEL4955	C++ SAGE		$127	
95	INEL4956	Fractional Frame Augmentation		$10	
95	INEL5201	Development of Prompt Gamma Assay Method for Mining of Phosphate Ore		$117	
95	INEL5204	Develop Intelligent Farm Management System Database Prototype		$29	
95	INEL5306	Measurement of Potato Water Content		$55	
95	INEL5308	Numerical Investigation of Dynamic Pressure Seals in Geologically Active Basins		$35	
95	INEL5604	Evaluation of Potential Antimicrobial Properties of Malted Barley and its Agricultural Applications		$31	
95	INEL5606	Biological System for Organic Acid Removal with Minimal Effluent		$41	
95	INEL5609	Isolation of Gossypol Degrading Bacteria		$45	

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
95	INEL5615	System for Growing Conifer Embryos		$74	
95	INEL6111	Improved Transformation and Regeneration Techniques for Cotton		$39	
95	INEL6808	Compressed Gas Safety Valve		$16	
95	INEL7105	Internal-Reforming SOFC Modeling		$70	
95	INEL7203	Advanced Methods for Adaptive Control for Automated Traffic Management		$48	
95	INEL7204	System Dynamics Model of Intermodalism		$39	
95	INEL8415	Alternate Joining Techniques for Textiles		$17	
95	INEL8416	Real-Time, On Loom Knit and "Hand" Characterization Using Diffractive Optical Methods.		$52	
95	INEL8506	Micromechanical Analysis Capability for Composite Materials		$35	
95	INEL8507	Preforms		$41	
95	INEL8510	Cooperative Industrial Research with GE Lighting Products		$38	
95	INEL8511	Lifetime Extension and Increased Reliability for Refinery Structures		$139	
95	INEL8515	Solar Bimodal Technologies Demonstration		$104	
95	INEL8516	Weight in Motion (WIM) Sensor and Signal Analysis Technology		$66	
95	INEL8517	Communications Spectrum Needs for Short Range IVHS Communications		$57	
95	INEL8518	Developing a Nonlinear Electromagnetic Modeling Capability using the Finite-Difference Time Domain Method		$64	
95	INEL8614	Electro Chemical-Based Processing Technologies		$127	
95	INEL8616	Nonaqueous Processing in the Textile Industry		$80	
95	INEL8708	Off-Line Manufacturing Simulation		$58	
95	INEL8712	Spray Forming Titanium Alloys into Billet and Sheet		$71	
95	INEL8806	Industrially Compatible Laser Ultrasonics		$90	
95	INEL9508	Optimization of Automobile Component Shapes		$54	
95	INEL9511	Mediator		$104	
95	INEL9512	Gas Driven Photovoltaic Generators		$18	
95	INEL9514	Measurement of Crude Oil Corrosivity		$5	
95	INEL9515	Installation of Precession X-Ray-Camera for Single Crystal Analysis		$1	
95	INEL9516	Direct Production of Low Cost High Quality Titanium Powder by Mechanical Alloying		$6	
95	INELW091	Petroleum Tanks Inspection Delivery System		$64	
96	INEL4029	MicroAntenna Solar Array Control Systems for Powering of Remote Sensors			$16
96	INEL4031	On-Line Sensors/Measurement Technologies for Monitoring and Control of Non-Process Elements in Minimum-Effluent Pulp and Paper Mills			$250
96	INEL4039	Development of a Sensor/Measurement System to Quantify Butterfat and Casein Proteins for Milk in Dairy Process Operations			$212
96	INEL4072	Intelligent Reuse Workstation (IRW)			$84
96	INEL4073	Development and Characterization of Measurement Systems and Subsurface Sensors for Oil and Gas Explorations and Productions			$150

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
96	INEL4082	Antigen/Antibody Detection Sensor With Application to High Throughput Identification and Screening			$112
96	INEL4091	Advanced Database Information Access			$115
96	INEL4125	Microbial Profile Modifications of Oil Reservoirs in Excess of 170 degree F			$106
96	INEL4129	Antimicrobial Properties of Malted Barley			$85
96	INEL4161	Innovative Strategies for Copper Leaching			$70
96	INEL4166	Sensor and Control Systems Testbed Development			$155
96	INEL4169	Environmental Problems in the Petroleum Industry			$150
96	INEL4176	Transportation Infrastructure Test Bed			$240
96	INEL4187	Novel Electronically Dithered Optical Filter for Atomosphere Remote Sensing of WMD Signatures			$250
96	INEL4203	A Real-Time Solidification Front Monitor for the Continuous Casting of Metals (INEL/URC)			$87
96	INEL4204	NDE of Oxide Inclusions in Copper Wire			$31
96	INEL4205	Nondestructive Inspection of Aging Aircraft Corrosion			$34
96	INEL4206	Advanced Technologies to Monitor and Control High Temperature Industrial Processes			$90
96	INEL4217	Industrial Ecology Product Development and Demonstration			$200
96	INEL4225	Spray Rolling Monolithic Metal and Composite Strip			$56
96	INEL4227	Rail Mounted Mobile Power			$150
96	INEL4230	Process Development and Application of Spray Deposited Materials			$43
96	INEL4233	Industrial Separations Process Materials			$241
96	INEL4235	Tailored Surface Chemistries			$116
96	INEL4241	Virtual Storefront			$82
96	INEL4249	Mediator Project			$400
96	INEL4257	Data Access Environment/Common User Interface			$150
96	INEL4271	National Site-Specific Technologies for Agriculture (SST4Ag)			$606
96	INEL4283	Advanced Methods for Sensor Fusion			$116
96	INEL4293	Liquified Natural Gas Transportation Technology			$150
96	INEL4299	Performance Optimization			$44
96	INEL4316	Law Enforcement/Counter Terrorism Initiative Plan			$79
96	INEL4332	Refinement and Commercialization of Opue Sensor-Based Electric Power and Energy Measurement System for Utility-Scale Transmission, Distribution and Protection Applications			$150
96	INEL4333	Advanced Optical Sensing for NDE			$200
96	INEL4337	Intelligent Power Distribution Controls and Sensors			$19
96	INEL4352	Systems Analysis Decision Tools for Sustainable Management of Natural Resources			$200
96	INEL4510	Advanced Power Sources (APS)			$25
96	INEL4511	Alkylation Catalysts for Operation at Supercritical Fluid Condition			$40
96	INEL4512	Chemical Sensor Systems for Realtime, Intelligent Air Quality Waste Site Characterization and Wide Area Monitoring Applications			$198

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
96	INEL4513	Advanced Regeneration Techniques and Gossypol Gene Isolation to Improve Food Grade Cottonseed			$69
		NATIONAL INTEGRATED ENVIRONMENTAL MANAGEMENT			
95	INEL0102	Assessment Methodology for Enhanced Bioremediation of Hydrocarbons in the Petroleum Industry		$49	
95	INEL0242	Catalyst Assisted Sonochemical Treatment of Hazardous Organic Wastes		$58	
95	INEL0247	Synthesis, Characterization, and the Modes of Interaction in VOC Sensor Materials		$42	
95	INEL0262	Integration of sample introduction techniques, torch design and optics for the determination of trace metals in biological samples with ICP-AES		$12	
95	INEL0303	Removal of Chlorinated Solvents from Air Streams using Anaerobic Biofiltration		$96	
95	INEL0306	Utilization of Sawdust for Microbial Abatement of Acid Mine Drainage		$52	
95	INEL1172	High Energy Computational Dosimetry		$42	
95	INEL1201	Photo-Catalytic Treatment of Anionic Cyanides		$60	
95	INEL1202	Catalytic Destruction of Halogenated Organics at Supercritical Fluid Conditions		$50	
95	INEL1203	Destruction of PCBs in Oil Using Gamma Irradiation and Ozone		$29	
95	INEL1233	Bioprocess Development for the Remediation of CR(VI) and U(VI) Contaminated Soils and Groundwater		$62	
95	INEL1306	Ultraviolet VOC Destruction Technology. Liner Lifetime and By-product Testing with Hazardous Waste Disposal Considerations		$50	
95	INEL2104	Portable Photon Analysis Spectrometer (PPAS) for TRU and Y Assay		$93	
95	INEL3203	Conceptual Design of a 55 Gallon Waste Container Refurbishment System		$52	
95	INEL3710	Photodissociation of Mercuric Chloride Treatability Study		$44	
95	INEL4078	INEL-U of I Laboratory for Liquid Extraction and Ion Exchange Research		$64	
95	INEL4090	Fracture Mechanics-Based Design Methodologies for Metal Matrix Composite Material		$30	
95	INEL4110	Develop, Build, and Test Assay System to Measure TRU and Fission Product Contamination in Subsurface Soil		$74	
95	INEL4171	Biodecontamination of Massive Concrete Structures		$159	
95	INEL4172	Catalyst Assited in-Situ Bioremediation		$90	
95	INEL4204	Sustainable Water Resources Management		$196	
95	INEL4275	High Sensitivity NDA for Transuranic Waste Characterization		$23	
95	INEL4374	Flexible Fish Conduit Passive System		$9	
95	INEL4550	Development of a Methodology for Assessment of Power Plant Emissions on Air Quality Related Values		$53	
95	INEL4579	Passive Containment of Volatile Organic Soil Vapors		$86	
95	INEL4581	Development of Vadose Zone Monitoring		$40	
95	INEL4863	Intelligent Sensor Data Acquisition Analysis		$41	

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
95	INEL4864	Modeling Underground Structures		$64	
95	INEL4865	Neural Analysis Techniques for Field Deployable Environmental Sensors		$75	
95	INEL5203	Grouping and Modeling Ecosystem Components for Ecological Risk Assessment		$43	
95	INEL5205	Water Shutoff in Producing Oil Wells Utilizing Bacteria		$76	
95	INEL5301	Estimating Sorption Properties of Clay Materials		$49	
95	INEL5303	Identification of a Surfactant/Alcohol/Polymer System for Safe Mobilization of TCE		$76	
95	INEL5601	Aquatic Vascular Plant Control		$98	
95	INEL5608	Bioprocessing of Indigo Textile Dye Waste Effluent		$73	
95	INEL5614	Removal of Methanol from Forest Products Industry Off-gases by Biofiltration		$92	
95	INEL6503	Nutrient Diffusing Substrata to Conduct Rational Bioremediation		$20	
95	INEL6701	An Intermediate to Field Scale Model for Predicting Porous Media Microbial Transport		$18	
95	INEL7907	PGNAA Methods Development for Waste Assay Applications		$65	
95	INEL8104	Real-Time Asbestos Analysis by Raman Spectroscopy		$39	
95	INEL8106	Rapid Agrochemical Sensor		$57	
95	INEL8403	In-Situ Biodegradation of High Energy Materials		$103	
95	INEL8409	Rapid Laser Assay of Surface Contamination During D&D		$40	
95	INEL8414	Measurement of Component Ratio in Oil/Water/Gas Mixtures and Determination of Flow Regime		$74	
95	INEL8509	Polyethylene Sulfur: Feasibility as a Waste Encapsulation Material for Low-Level and Mixed Wastes		$33	
95	INEL8514	In-Field Assay for PPM Levels of Cr in Environmental Media		$57	
95	INEL8615	Low temperature Reductive Catalytic Destruction of Halogenated Organics		$57	
95	INEL9510	Periphyton Communities for Environmental Monitoring		$43	
95	INEL9513	Tolo Lake Mammoth Excavation		$35	
95	INELW007	Alternate Material for Stainless Steel Lined Concrete		$138	
95	INELW016	Oxidative Processes for the Remediation of Contaminated Soils		$56	
95	INELW019	Solid Phase Microextraction		$19	
95	INELW027	Synthesis and Characterization of Pt/Pd Compounds for a Fiber Optic Based Sensor for VOCs		$96	
95	INELW029	ICPP Testbed Framework and Field Tests		$136	
95	INELW032	Electrocatalytic Vapor Sensor		$82	
95	INELW043	Characterization of Fuel Processing/Waste Form Chemistry by High Temperature Mass Spectrometry		$111	
95	INELW089	Telepresence for Mobile Robotics in Nuclear Environments		$109	
95	INELW097	Sodium-Bearing Waste Treatment Technology for Separating the Nitrate Anion and Alkali Salts Using Ion-Exchange		$10	

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
95	INELW104	The Effect of Thermal Treatment of INEL Soil Prior to Cementitious Solidification		$51	
95	INELW109	Automatic Pressurized Filtering of Environmental Samples for Remote Applications		$99	
95	INELW111	Position Tracking for Remote Subsurface Characterization Systems		$41	
95	INELW122	Evaluation of Delphi Oxidation for Activated Carbon		$7	
95	INELW123	Evaluation of EET Proprietary Decontamination		$31	
96	INEL2017	Testing and Demonstration of a Supercritical Carbon Dioxide Decontamination Technique			$190
96	INEL2023	Petroleum and Environmental Model Benchmarking and Evaluation			$91
96	INEL2027	Subsurface Radiological Assay Instruments			$154
96	INEL2033	Polymeric Solvents for Minimizing Pollution in Chemical Synthesis, Separations, and Cleaning Operations (V04 - URC)			$38
96	INEL2037	Portable Photon Analysis Spectrometer (PPAS) for TRU and X- & Y-Ray Assay			$100
96	INEL2053	Development of Methods for Rapid Site Specific Hazard Assessments			$200
96	INEL2063	Development of a Cooperative Research Effort for the Design and Testing of Ballistic Materials at the INEL			$190
96	INEL2078	Ultraviolet VOC Destruction Technology			$127
96	INEL2083	Gas Tracer Test for Verifying the Integrity of Stabilized or Isolated Buried Waste			$54
96	INEL2086	Use of Depleted Uranium and Radioactively Contaminated Stainless Steels in Casks			$15
96	INEL2111	Remote Monitoring of In-Situ Contamination Using Optical Spectroscopy (URC Collaboration)			$52
96	INEL2122	Polyethylene Sulfur Cement: Feasibility as A Waste Encapsulation Material for Low Level Mixed Waste			$29
96	INEL2137	Removal of Chlorinated Solvents from Air Streams Using Anaerobic Biofiltration and Chemically Assisted Anaerobic Biofiltration			$95
96	INEL2138	Engineering Design of In-Situ Bioremediation Comparing Accelerated and Catalyst Assisted In-Situ Bioremediation Using Differential Soil Bioreactors			$182
96	INEL2141	Aquatic Plant Control			$56
96	INEL2157	Biomonitoring			$93
96	INEL2160	In-Situ Biodegradation of High Energy Materials			$80
96	INEL2192	Waste Drum Refurbishment			$43
96	INEL2194	Membrane Processes for the Recovery of Radioactive Species from Acidic Solutions (URC)			$16
96	INEL2195	Radionuclide Removal from Contaminated Soil and Debis Leachates by the Application of 3M Web Technology			$178
96	INEL2197	Development, Field Demonstration, and Commercialization of Vadose Zone Sensors for Characterization, Remediation, and Post-Closure Monitoring at Contaminated Sites			$87
96	INEL2228	INEL-UI Laboratory for Liquid Extraction and ION Exchange Research, Third Year			$73
96	INEL2236	Toxic Metal Speciation for Mobility Assessment			$125

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INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
96	INEL2245	Laser Enhanced Zero Added Waste Cutting, Abrading and Drilling			$130
96	INEL2247	Environmental Separations			$60
96	INEL2260	Development and Testing of Supercritical Water Oxidation for Industrial Applications			$96
96	INEL2288	Shielded RH-TRU Container			$114
96	INEL2341	Comparison of Conservatism and Uncertainty of Different Approaches for TRV Development in ERA			$41
96	INEL2342	An Approach to Estimating Plant Contaminant Uptake for Risk Assessment Exposure Modeling			$90
96	INEL2344	Development of Coatings for Waste Container Refurbishment			$41
96	INEL2346	Source Group Optimization Program for Air Dispersion Modeling of Multiple Hazardous Air Pollutant Sources			$91
96	INEL2349	Characterize and Model Final Waste Formulations and Offgas Solids form Thermal Treatment Processes			$48
96	INEL2381	Bioprocess Engineering for Gas/Solid Treatment			$191
96	INEL2480	Automatic Identification/Robotics Integration for Drum Handling and Automated Laboratory			$156
		NATIONAL INTEGRATED TECHNOLOGY TEST/EVALUATION CENTER			
95	INEL5610	Microstructural Influences on Biocorrosion		$33	
95	INEL7603	Advanced Combined Environments Test Station (ACETS) Scoping Studies		$388	
95	INEL8501	Characterization of Aged Materials with NDE and Internal Friction Measurements		$74	
96	INEL1118	Advanced Combined Environments Test Station (URC G350)			$214
96	INEL1132	Microbial Corrosion of Concrete: Sensors and Test Cells			$185
96	INEL1202	Full Scale Testing of Large Structures to Verify Models for Predicting Lifetime Extension			$200
		NUCLEAR OPERATIONS & NUCLEAR MATERIALS DISPOSITIONING			
95	INEL1102	ATR Radioisotope Production and Purification Study		$109	
95	INEL1171	Neutron Delivery System Study		$108	
95	INEL1173	Real-Time Measurement Dosimetry for BNCT		$33	
95	INEL2108	Mixed Oxide Fuels Testing in the Avanced Test Reactor		$114	
95	INEL2111	General Purpose Time-Dependent Particle Transport with Isotope Generation and Depletion		$57	
95	INEL2205	Development of a Simplified Version of SCDAP/RELAPS for Simulator Applications		$138	
95	INEL2207	Non-Fertile Fuel Fabrication Development and Irradiation Performance Assessment		$67	
95	INEL2302	Photoneutron Studies for Radiotherapy		$46	
95	INEL2303	Feasibility Study of Using INEL Developed Transport Tools to Calculate Photodynamic Dosimetry		$29	
95	INEL2304	Kinetic Modeling of the ITER Dissipative Divertor		$119	
95	INEL5304	Automated Neutron Probe Monitoring		$68	
95	INEL7909	Tritium Production by Irradiation of 3He		$61	
95	INEL9517	Technetium		$54	
95	INELW030	On-Site F-18 Production		$70	

* Fiscal year actuals for FY96 unavailable at this time

INEL LDRD INVESTMENT - FISCAL YEARS 1994-1996

FY	PROJ. NO.	PROJECT TITLE	FY94 ACTUAL $K	FY95 ACTUAL $K	FY96 ALLOCATED* $K
95	INELW036	WERC University Design Competition		$12	
96	INEL1213	Center for Reliability and Risk Assessment			$50
95	INEL2245	Laser Enhanced Zero Added Waste Cutting. Abrading and Drilling			$130
96	INEL3052	Miniature Solid Oxide Fuel Cell Research & Development			$152
96	INEL3055	Development of INEL y-Ray Spectrometry Resource Center			$88
96	INEL3092	Development of Advanced NDE and Mitigation Technologies			$134
96	INEL3101	RELAP5 Simulator			$250
96	INEL3273	Neutron Delivery System for Fast Neutron Radiotherapy			$187
96	INEL3274	High-Energy Computational Dosimetry for Neutron Radiotherapy			$100
96	INEL3276	URC Collaboration for Boron Neutron Capture Synovectomy			$1
96	INEL3364	Plutonium Vitrification			$100
96	INEL3365	Technetium Separation System			$600
		LONG TERM RESEARCH INITIATIVES			
94-96	INEL0001	Advanced Biotechnology	$301	$300	$350
94-96	INEL0002	Nuclear Physics	$317	$328	$233
94-96	INEL0003	Theoretical Chemistry	$304	$278	
94-96	INEL0004	Condensed Matter/Materials Science	$372	$318	$233
94-96	INEL0005	Computational Mechanics	$340	$318	$269
94-96	INEL0006	Non-Conventional Bioprocessing	$320	$314	
94-96	INEL0007	Radiation Measurements	$325	$355	
94-95	INEL0008	Nuclear Fuels and Materials	$337	$335	
94-96	INEL0009	Experimental Thermal Science	$317	$301	$233
96	INEL5300	Corrosion			$350
96	INEL5600	Nuclear Fuel Storage			$175
96	INEL5800	Porous Media			$300
96	INEL5900	Separations Technologies			$350
		TOTAL	$10,812	$14,670	$13,782

* Fiscal year actuals for FY96 unavailable at this time

Lawrence Berkeley National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
Bioscience and Biotechnology				
LB92021	Comprehensive Approach to Protein Folding	99		
LB93008	Development of Microchemical Methods for Biological Assays	95	69	
LB94009	Electron Crystallography of Selected Membrane Proteins	80	148	
LB94010	Biological Dosimetry and Risk Assessment: Propagation of Genetically Damaged Hemopoietic Stem Cell Progeny	45	49	
LB94011	Creation of Transgenic Mice Containing a Library of P1 Clones Encompassing the Down's Syndrome Region from Chromosome	21	190	266
LB94012	A Transgenic Model for Clinical Testing of Progestins and Analysis of Progesterone Receptor Function	60	70	
LB94013	Variations in Susceptibility to Environmental Oxidants as Studied Using Transgenic Mice	125	110	
LB94029	Hyperthermophilic Microorganisms	108	100	
LB94030	A Molecular Description of Transmembrane Signaling	73		
LB95011	Isolation of Genetic Supressor Elements in Human Mammary Epithelial Cells		67	
LB95022	Integrated Molecular Cytogenetics Workstation		57	
LB95023	Biological X-ray Microscopy		41	100
LB96013	Computational Investigation of Chromatin Structure			80
LB96014	Techniques for Discovery of Disease-Related Genes			460
LB96015	Theoretical Models for DNA Structure and Function			50
LB96016	Role of Recombinational Repair in Mammals: Analysis in Yeast of the Human DNA Repair Gene XRCC3			100
LB96017	Crystallization and Structure Determination of Integrin aIIbb3, a Platelet Membrane Protein Receptor			90

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
Particle and Photon Beams				
LB92035	Laser Trapping of Neutral Atoms	140		
LB92037	New Concepts in Isospin Studies	114		
LB93002	Scattering Techniques for Femtosecond X-ray Pulses	488	520	
LB94001	Experimental Investigation of High-Average-Power Applications of Ion Induction Linacs	141		
LB95002	"Superbend" — A 5 T Bending Magnet for the ALS		293	250
LB95014	Application of Synchrotron Radiation to Processing of Semiconductor Materials		56	
LB95017	New Techniques for Low-Energy Nuclear Beams		183	
LB96002	Physics and Biology of BNCT			100
LB96022	A Third Generation ECR Ion Source			150
Characterization and Synthesis of Materials				
LB92011	Short-Wavelength LED Materials: GaN and SiC	88		
LB92028	Transport Spectroscopy of Quantum Dots	75		
LB93014	Electronic Thermalization in Metals and Semiconductors	170	122	
LB93015	Electron-Beam Lithographic Fabrication of Submicron Junctions for Macroscopic Quantum Tunneling, Coulomb Blockade and High-Tc SQUIDS	59	89	
LB93016	Isotope Heterostructures Selectively Doped by Neutron Transmutation	70		
LB93020	Time-Resolved Studies of VUV, XUV, and Soft-X-Ray Photoinduced Chemistry at Surfaces	65	78	
LB94014	Novel Polymeric Thin Films for Entrapment and Detection of Small Organic Molecules	59		
LB94015	Time- and Frequency-Resolved Spectroscopy of Single Nanostuctures and Clusters	134	112	

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
LB94017	Structural Studies of Adsorbates and Magnetic Systems with Circular-Polarized Synchrotron Radiation and Photoelectron Spin Resolution	92		
LB94018	Quantum Hall Plateau Transitions of a Two-Dimensional Electron Gas in Strong Magnetic Fields	18	86	50
LB94020	Infrared and Terahertz Spectroscopy of Artificially Structured Magnets	94	51	
LB94021	Establishment of the Thermodynamic Temperature Scale in the mK Region	77	53	
LB94022	Investigation of Nanometer Magnetism by Using Surface Magneto-Optic Kerr Effect (SMOKE)	26	60	
LB94023	Fundamental Relationships Between Mechanical Properties and Structure in Diamond Films	41		
LB94024	Atom-by-Atom Chemistry and Processes by Low-Temperature (4 K) Scanning Tunneling Microscope	76		
LB94027	Spin-Polarized Photoemission Studies of Magnetic Surfaces, Interfaces, and Films	124	410	200
LB95012	A Low Temperature AFM for Imaging Current Flow in Nanostructures		55	
LB95013	Catalytic Routes to a Cleaner Environment		173	
LB95016	Conducting and Semiconducting Boron–Nitrogen–Carbon Nanowires		44	
LB96003	Network Silicates With Porphyrin Backbones: Novel Solids and Catalysts			80
LB96019	Synthesis of Oriented Nanoparticulate and Dense Crystalline Ceramic Films Using Biomimetic Membranes			70
LB96020	New Magnetic Phases of MBE Grown Ultrathin Films			50
LB96021	Functionally Graded Ceramic–Metal Architectures for High-Temperature Applications			70

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
Advanced Technologies for Energy Supply and Energy Efficiency				
LB94005	Alternative Strategies to Improve Air Quality in the Los Angeles Basin	100		
LB95007	Broad-Band High-Resolution Microcalorimetry for Biological and Materials Science Applications on the ALS		103	
LB95008	Research to Improve the Development of Energy-Efficient, Low-Polluting Automobiles		138	
LB95009	Building Performance Assurance		370	280
LB96006	In Situ Detection of NO and NO2 and Their Precursors			125
LB96007	Mechanism and Modeling of Soot Formation in Hydrocarbon Flames			75
LB96009	Metal-Specific Chemical Sensors Using Polymer Films for Nonproliferation and Environmental Science			80
LB96011	Techniques for the Nondestructive Evaluation and Testing of Vehicle Bodies and Components			50
Chemical Dynamics, Catalysis, and Surface Science				
LB92002	Exploration of the Interface Between Homogeneous and Heterogeneous Catalysis	75		
LB92003	Ultrafast Dynamics of Electrons at Surfaces	99		
LB93004	Structure and Chemistry of Nonmetallic Adsorbates at Compound Semiconductor Interfaces Investigated by Synchrotron Radiation Techniques	74	50	
LB94019	Fundamental Investigations of the Chemical Vapor Deposition of Ge, GaAs, and ZnSe on Si	42	78	
LB94025	Nanosynthesis	56	92	
LB94026	Combinatorial Synthesis of High Tc Superconductors	185	84	
LB94028	Chemical/Hydrodynamical Computational Models for Combustion Systems	20		
LB95003	Magnetic Properties and Electron Localization at Interfaces		116	100
LB96018	New Chemistry for Epitaxial Growth of p-Type Gallium Nitride and its Alloys			133
LB96027	New Chemistry for Pollution Prevention			300

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
Advanced Detector Systems				
LB92039	New Si Microstrip Disk Detector for Vertex Reconstruction of B Meson Decays	80		
LB93012	Head Probe for Nuclear Magnetic Resonance Imaging and Spectroscopy at 10 T	50		
LB93021	Microstrip Gas Chambers for TPC Readout	45		
LB93022	The Portable DAQ: A Data Acquisition System for Particle Physics Based on a Stadardized Software Bus	94		
LB93023	Directions for a Particle Astrophysics Initiative Additional Observations of the Cosmic Microwave Background	125		
LB94006	Development of Next-Generation Detectors for Use at the Advanced Light Source	115		
LB94016	New Directions for In Situ Electron Microscopy at High Spatial Resolution	100	158	
LB94032	Evaluation of Trigger Algorithms for an Upgraded Silicon Microvertex Detector	37		
LB95001	Technology for Proton Colliders at High Energy and Luminosity		206	150
LB95010	Advance Towards the Next Generation of Pixellated Detectors for Protein Crystallography		294	163
LB95015	Ultrafast Surface Dynamics with Atomic Resolution		101	
LB95018	New Research Directions in Nuclear and Particle Astrophysics (INPA)		58	
LB95020	Integrated Instrumentation System for Drift Chambers, TOF, Cerenkov, and Silicon Detectors		196	
LB95021	Development of High-Resistivity Charge-Coupled Devices for Imaging		88	
LB96001	A Neutron Logging Instrument for Earth Sciences			180
LB96010	Development of Next-Generation Detectors for Advanced Spectroscopies			120
LB96024	Pixel Detectors for Charge Particle Detection			120
LB96025	Development of a UV Photosensor for Use in High Magnetic Fields			150
LB96026	System Design and Electronic Specifications for a km-Scale Neutrino Astrophysical Observatory (NAO)			120

Lawrence Berkeley National Laboratory
LDRD Program Summary
FY 1994 - FY 1996

PROJECT NUMBER	TITLE	FUNDING ($K) FY 94	FY 95	FY 96
Environmental Assessment and Remediation				
LB93006	X-Ray Absorption Spectroscopy and X-Ray Microprobe Studies of Contaminated Soils	71		
LB94002	Application of the Advanced Light Source to the Study of Trace Element Adsorption and Distribution in Soil Carbonates	18	36	
LB94003	Characterization and Monitoring of Subsurface Biologic Activity Using Stable Isotope Soil Gas Analysis	78	82	50
LB94004	Microbial Transformation of Petroleum Hydrocarbons in Transient Subsurface Environment	100	115	
LB94007	Demonstration of Stable Isotope Tracer Methods in Detailed Hydrogeologic Modeling and Monitoring	136		
LB94031	SELECT, Development of a Site Remediation Analysis and Decision Support Software	375	434	320
LB95004	Studies in the Geologic Disposal of Nuclear Waste		21	
LB95005	Microbial Transport and Microbial and Nutrient Delivery in Subsurface Environments		75	80
LB95006	Toxicity at Mare Island Naval Shipyard		78	60
LB96004	Bioavailability and Degradation of Neutral/Base Aliphatic and Aromatic Hydrocarbons from Soil			200
LB96005	Developing High-Resolution Synchrotron X-ray Techniques to Study Natural Porous Media			120
LB96008	Kinetics and Modeling of Anaerobic TCE Degradation for In Situ and Ex Situ Applications			60
Other (e.g. Computation and Information Management)				
LB94008	Visual Servoing for Scientific Applications	143		
LB95019	Global Gravitational Anomalies in Three Dimensions		30	
LB96012	Development of a National, Distributed Computational and Data Storage and Analysis Capability			220
LB96023	Mathematical Algorithms for Shape Detection			50
	TOTALS	5,240	6,365	5,206

Lawrence Livermore National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Advanced Sensors & Instrumentation					
95-ERP-126	Proof-of-Concept Development for Accelerator Mass Spectrometry Inverse PIXE	0.00	146.63	0.00	A, E
93-DI-032	Multidisciplinary Forensic Science Research and Applications: A Scientific and Technology-Based Initiative	315.85	0.00	0.00	A, C
94-ERP-043	A Novel Ultrahigh-Resolution Spectrograph for Studying the Interstellar Medium	162.97	157.97	0.00	A, C
94-ERP-050	A Search for the Optical Counterparts of Gamma-Ray Bursts	149.45	216.33	0.00	A, C
95-LW-105	A Hot-Electron Tunneling Spectrometer for X and Gamma Rays	0.00	182.49	224.00	A, C
96-ERI-001	Practical Light Source for Absorption Spectroscopy	0.00	0.00	153.00	A, C, E
95-LW-028	Diffractive Optics for Compact Flat-Panel Displays	0.00	208.24	213.00	A, C, H
93-ERP-046	Novel High-Energy-Density Materials: Synthesis by Megabar Hot Pressing	377.16	338.75	0.00	A, H
95-ERP-039	Computer Simulation of Covert Delivery Defense Architectures	0.00	268.32	0.00	A, H
96-ERD-058	Thermally Robust, Optical Semiconductor Devices Using MBE-Grown AlGaInAs	0.00	0.00	270.00	A, H
96-ERD-073	Advanced Photoinjector Laser and Microwave Technologies	0.00	0.00	500.00	A, H
94-ERD-032	Materials Physics at Short Time Scales	408.12	0.00	0.00	A
95-ERP-002	Nondestructive Evaluation for Pit Inspection	0.00	291.11	306.00	A
96-ERD-034	Sensitive Detection of Atomic Scale Defects with Microscopic Spatial Resolution	0.00	0.00	700.00	A, I, H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
94-SR-009	Treated or Impregnated Aerogels as an Environmental and Industrial Sampling Media for Airborne Target Compounds	134.61	0.00	0.00	B, E
94-SR-020	Electrochemical Sensors for Environmental Monitoring and Process Control	133.38	0.00	0.00	B, E
95-ERP-125	Reducing Hazardous Wastes in Parts Cleaning Operations Through Real-Time Surface Analysis	0.00	46.81	50.00	B
93-ERD-032	Science with the Super Cameras	624.67	376.57	0.00	A, C
96-ERD-017	Development of Chemically Amplified Optical Sensors for Biomedical and Defense Applications	0.00	0.00	492.00	A, C
95-ERP-131	Low-Probability-Intercept Optical Communications System	0.00	275.02	0.00	A, C, H
93-ERP-166	Infrared Imaging Fourier Transform Spectrometer for Nonproliferation Applications	314.36	0.00	0.00	B, C
94-DE-002	High-Sensitivity Gamma-Ray Detection System	168.00	0.00	0.00	C, E
94-DI-005	Color Gamma-Ray Camera	1078.37	34.82	0.00	C, E
94-ERP-010	Investigation of Microscale Electromechanical Technologies for Continuous Monitoring	189.11	0.00	0.00	C, E
94-ERP-030	Active Remote-Sensing Program	614.99	690.92	0.00	C, E
95-ERP-038	Optical Pumping for Remote Sensing	0.00	227.66	300.00	C, E
96-ERD-068	Microradar Array Imaging	0.00	0.00	210.00	C, I
93-DI-046	Monolithic Millimeter-Wave and Picosecond Electronic Technologies	545.17	472.72	0.00	C, H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
93-DI-047	Weapon Neutralization and Positive Disarmament	2115.99	1486.88	0.00	A, H
94-ERP-076	Advanced Magnetic Head Development	250.00	0.00	0.00	A, I
95-ERD-005	Fundamental Studies of Matrix-Assisted Laser Desorption/Ionization: Using Time-of-Flight Mass Spectrometry to Identify Biological Molecules	0.00	158.55	150.00	C, E
93-ERP-012	Radar Remote Sensing	646.20	808.37	0.00	C, H
94-ERP-048	Electromagnetic Fence	321.40	0.00	0.00	H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Atmospheric & Geosciences					
94-SR-042	X-Ray Diffraction Studies of Laser-Heated Iron and Actinides at High Pressures and Temperatures: A New Technique with	370.30	0.00	0.00	A, E
94-DE-003	Isotope Methods for Groundwater Hydrology	218.86	0.00	0.00	B, E
95-ERD-018	Selenium Isotope Geochemistry: A New Approach to Characterizing the Environmental Chemistry of Selenium	0.00	184.94	180.00	B, E
95-ERD-045	Isotope Measurements for Innovative Groundwater Management	0.00	273.59	280.00	B, E
96-LW-108	Deep Earthquakes as Expressions of Transformational Faulting at Extremely High Pressures	0.00	0.00	202.00	A, B, I
93-ERI-045	Deep Structure and Properties of Major Continental Fault Zones	122.94	148.32	0.00	B, E, I
95-ERI-007	Shock Features in Minerals	0.00	102.68	0.00	B
92-DI-003	Computational Earthquake Initiative	498.53	0.00	0.00	B, E, I
94-ERD-039	Advanced Earthquake Hazard Prediction Research	304.72	278.60	161.00	A, I
94-SR-013	A Real-Time Earthquake Warning System Using Neural Networks	173.82	0.00	0.00	A, B, I
94-SR-021	Earthquake Alert Systems	53.83	0.00	0.00	A, B, I
95-ERD-027	Deep Scientific Drilling in the San Andreas Fault Zone: Candidate Site Characterization and Technology Development	0.00	93.25	88.00	A, B, I
95-LW-075	Investigating Excessive Ground Motion at the I5–H14 Interchange during the January 1994 Northridge Earthquake	0.00	150.54	205.00	B, I
96-ERI-002	Solar System Events at High-Spatial Resolution	0.00	0.00	154.00	C, E

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
93-ERI-046	High-Resolution Astronomy	177.97	185.55	0.00	C, H
96-ERD-065	PAAS: A Pre-/Post-Strike Atmospheric Assessment System	0.00	0.00	400.00	C, H
94-ERI-005	A Tale of Two Plateaus: Tibet and the Altiplano	340.68	299.62	203.00	E, F
94-LW-037	Electrical Conductivity of Lower-Mantle Minerals	212.13	215.67	0.00	E, F
96-ERI-005	Subduction and Mantle Recycling	0.00	0.00	300.00	E, F
95-ERP-022	A Nested-Modeling Study of Precipitation and Hydrology in the Western United States	0.00	185.58	176.00	E, I
96-ERI-004	Tectonic Development of Blind-Thrust Faults Along the California Margin: A Seismic Investigation Near Parkfield, California	0.00	0.00	69.00	E, F, I
92-DE-015	Aerosol–Cloud Interactions in a Global Climate Model	168.03	0.00	0.00	C, E
92-DI-006	Earth System Modeling	1443.58	0.00	0.00	C, E
93-ERD-041	Evaluating the Importance of Innovative Heterogeneous Chemistry to Explain Observed Stratospheric Ozone Depletion	163.99	163.05	0.00	E
93-ERD-063	Chronology of Climate Change	240.17	0.00	0.00	E
93-LW-045	Measurements and Analysis of Erythemal Solar Radiation at Livermore	82.95	0.00	0.00	C, E
94-ERD-037	Multiscale Atmospheric Simulation System	181.74	280.90	244.00	C, E
94-ERI-006	Climate Change and the Carbon Cycle: Mechanisms and Responses	99.83	265.61	234.00	E
94-ERP-072	Advanced Measurements for Atmospheric Modeling	237.37	0.00	0.00	C, E

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
94-SR-057	Enhanced Global Climate Modeling	184.81	0.00	0.00	C, E
95-DI-005	Advanced Integrated Measurements and Modeling Initiative: Global Carbon Cycle	0.00	1057.08	1005.00	E
95-ERD-030	Global Warming and Changes in Ocean Circulation	0.00	201.15	205.00	E
95-ERP-024	Past and Future Climate Response to Aerosols	0.00	145.42	131.00	C, E
92-IN-036	Effects of Impacts and Phase Transitions at High Pressures	124.50	0.00	0.00	A, F, I
93-ERI-049	Physics and Chemistry of Earth Materials	149.61	145.83	0.00	B, F, I
95-ERP-133	Atmospheric Modeling for Combat Simulations	0.00	143.90	0.00	A, E, H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Biotechnology & Health Care					
94-ERD-036	All-Particle Monte Carlo Transport and Nuclear Data for Radiation Oncology	339.85	388.08	0.00	A, I
93-ERD-043	Feasibility of Iodine Dosimetry at Chernobyl Using Accelerator Mass Spectrometry	118.29	141.30	0.00	A
95-LW-108	Micromachined Chemical Jet Dispenser	0.00	230.48	0.00	A
96-ERD-076	Challenges in Biotechnology: Expression of Genes	0.00	0.00	100.00	B
92-DI-002	Low-Level Detection of DNA and Protein Damage: Extrapolation from Animals to Humans	711.76	0.00	0.00	B
95-ERP-005	New Technology for High-Speed Detection of Damage Using Accelerator Mass Spectrometry	0.00	97.97	88.00	B
95-LW-081	Large-Scale Mapping of Human Genes	0.00	234.59	0.00	B
96-ERD-011	Quantitative Cytometric Analysis for Toxicology and Carcinogenesis Research	0.00	0.00	200.00	B
94-ERI-007	Biomedical and Environmental Isotope Tracing Research	417.87	255.45	234.00	B, E
93-IN-006	Adaptive Computer Vision and Smart Sensing for Automatic Monitoring Systems	78.94	0.00	0.00	B, C, H
96-DI-009	A Portable System of the Rapid Detection and Identification of Bacterial Warfare Agents	0.00	0.00	1017.00	C
94-ERD-009	Diode-Laser-Based Flow Cytometer	494.48	277.57	0.00	C
93-ERD-015	Osteoporosis Research	143.27	191.41	0.00	A, I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
95-DI-003	Development of New Materials and Tools for Minimally Invasive Medical Procedures	0.00	1818.88	1073.00	A, I
95-LW-078	Designing a New Class of Site-Specific DNA-Cleaving Reagents	0.00	185.17	0.00	C, E
93-ERI-053	A Computational Model of the Human Hand	427.00	194.40	0.00	E, I
94-FS-138	Immunological Treatment of Metastatic Melanoma	13.24	0.00	0.00	E, I
94-LW-103	Application of Alu Repeats to Forensic DNA Testing and the Study of Human Genetic Variation	218.38	0.00	0.00	E, I
95-ERP-145	Immunological Treatment of Metastatic Melanoma I: Studies Relating to Reversal of Immune Suppression	0.00	20.48	39.00	E, I
93-DE-051	Exploring Biomaterials	103.71	0.00	0.00	E
93-DI-002	Advanced Instrumentation for Rapid DNA Sequencing and Large Fragment Separation	120.55	0.00	0.00	E
93-DI-003	Structural Analysis of Small Molecules, Proteins, and Their Interactions with DNA	1820.67	2200.01	0.00	E
93-ERP-007	Human DNA Repair Proteins: Development of Antibodies and Purification Systems	345.77	341.04	0.00	E
94-LW-083	Mosaicism as a Causative Factor for Germinal and Somatic Disease	110.50	0.00	0.00	E
96-DI-010	High-Resolution Structure Determination and Computational Modeling of Proteins and Damaged Nucleic Acids	0.00	0.00	2400.00	E
96-LW-045	Low-Resolution Footprinting and High-Resolution Mapping with the Atomic Force Microscope	0.00	0.00	250.00	E

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
96-LW-091	Genomic Instabillity at Recombinase Signal Sequences in the CS Alu Element.	0.00	0.00	215.00	E
96-LW-029	Scientific Understanding of Catheter-Based Interventions for Coronary Artery Disease.	0.00	0.00	245.00	I
93-ERP-140	The Effects of Ergonomically Designed Computer Keyboards on Cummulative Trauma Disorders	163.59	89.89	0.00	I
93-LW-036	Scientific Basis for the Clinical Application of Lasers on Root Dentin	249.83	0.00	0.00	I
96-LW-084	Acoustic 3D Imaging of Dental Structures	0.00	0.00	196.00	I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Computing/Modeling/Simulation					
96-ERD-057	Photonics Analysis and Design	0.00	0.00	295.00	A, C, H
94-ERI-004	Coupled Models in Low-Frequency Electromagnetic Simulations	150.66	186.55	216.00	A, H
92-DE-020	Advanced Materials Design by Massively Parallel Computers: Applications to Ceramics and Multilayer Materials	284.19	0.00	0.00	A, E, H
92-SR-009	New Concepts in Particle Transport	49.92	0.00	0.00	A, E, H
92-SR-027	Distributed File System and Security for the Remote Experimental Site	36.79	0.00	0.00	A, E, H
92-SR-040	Research in the Effective Use of Circuit Switches in Data Communications	407.15	0.00	0.00	A, E, H
93-DI-029	Software Studies for a Massively Parallel Production Computer	581.44	0.00	0.00	A, E, H
93-ERD-061	Scientific Visualization of Multivariate and Vector Fields in Three Dimensions	348.39	226.33	0.00	A, E, H
93-ERP-051	Dynaflow—Fluid Dynamics	507.26	409.88	0.00	A, E, H
93-ERP-090	High-Performance Storage and Input/Output to Support Scientific Applications	512.57	517.72	0.00	A, E, H
93-ERP-100	PDDP: The Parallel Data Distribution Preprocessor	331.60	130.64	0.00	A, E, H
94-DE-025	Theory of Self-Learning Neural Networks	216.76	0.00	0.00	A, E, H
94-DE-028	Molecular Dynamics, Smoothed-Particle Hydrodynamics, and Nonequilibrium Flows	139.84	0.00	0.00	A, E, H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
94-ERP-016	Massively Parallel Mesh Generation for Physics Codes	494.97	510.44	0.00	A, E, H
94-ERP-037	Multidimensional Free-Lagrange Hydrodynamics Using Unstructured Polyhedral Grids on Multiple Meshes	510.84	449.36	0.00	A, E, H
94-ERP-044	Integrated Astrophysical Modeling	162.90	264.33	180.00	A, E
94-IN-001	Alternative Algorithms for Computational Fluid Dynamics	75.12	0.00	0.00	A, E, H
95-ERD-036	Extending the Low-Frequency Electromagnetic Plasma Simulation Models to Three Dimensions	0.00	168.36	100.00	A, H
95-ERI-004	Motion Description for Data Compression and Classification	0.00	243.50	207.00	A, H
95-ERP-021	Feasibility of Optically Interconnected Massively Parallel Processors Using Wavelength Division Multiplexing	0.00	203.42	0.00	A, E, H, I
95-ERP-026	Very High Speed Metropolitan Optical Networking	0.00	192.04	186.00	A, E, H, I
95-ERP-034	High-Resolution, Adaptive Numerical Simulation of Plasma Processing	0.00	163.09	203.00	A, I
95-ERP-036	PVODE: A Parallel Solver for Ordinary Differential Equations	0.00	147.26	182.00	A, E, H
95-ERP-043	Applied Electromagnetic Simulation on Parallel Computers	0.00	139.00	200.00	A, H, I
95-ERP-044	Three-Dimensional Simulation of Plasmas	0.00	280.64	180.00	A, E
95-ERP-045	Atomic-Level Materials Simulation on Scalable Massively Parallel Processors	0.00	283.21	225.00	A, E, H I
95-ERP-046	Implicit and Explicit Finite Element Algorithms for Massively Parallel Computers with Applications in Solid and Structural Mechanics	0.00	245.60	334.00	A, E, H I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
95-ERP-137	Development and Expansion of High-Speed Network Capabilities	0.00	221.63	0.00	A, E, H, I
95-LW-056	Novel Operation of a Semiconductor Optical Amplifier for Optoelectronic Applications	0.00	84.71	0.00	A, E, H, I
95-LW-104	Large-Eddy Simulation of Turbulent Separating Flow Using the Finite-Element Method	0.00	180.45	189.00	A, H
96-ERD-028	Exploring and Documenting Legacy Data	0.00	0.00	195.00	A
96-ERD-029	A Portable Input/Output Library for Massively Parallel Processors	0.00	0.00	151.00	A, E, H, I
96-ERD-037	NIKE-TOPAZ-ALE Methodology for Thermal Forming and Joining	0.00	0.00	216.00	A, I
96-ERD-041	Development and Evaluation of an Efficient Parallel Programming Methodology That Spans Multiple Architectural Targets	0.00	0.00	200.00	A, E, H, I
94-DE-023	Computational Methods for Transport Modeling	201.34	0.00	0.00	B, E, I
96-ERD-054	Use of High-Performance Computing for the Management of Groundwater Resources in Large Aquifer Systems	0.00	0.00	175.00	B, E, I
95-ERP-139	Advanced Computational Methodologies for Multiphase Flow in Heterogeneous Porous Media	0.00	572.41	571.00	B, F
93-DI-041	Research on Advanced Data Fusion Technologies	720.83	0.00	0.00	A, C, H, I
96-LW-053	Image and Video Compression/Decompression Based on Human Visual-Perception System and Transform Coding	0.00	0.00	225.00	A, C, H
94-ERP-011	Multi-Image Signature Analysis	118.79	189.46	0.00	A, C

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
96-ERD-066	Interlace Restoration	0.00	0.00	125.00	C
95-ERP-042	A Scalable Parallel Capability for Particle Detector Design and Physics Analysis	0.00	185.69	300.00	A, E
96-ERI-003	A New Approach to Orthopedic Implant Design	0.00	0.00	465.00	A, I
96-ERD-008	Computational Infrastructure for Law Enforcement	0.00	0.00	40.00	C, I
95-ERP-047	Climate System Modeling on Massively Parallel Systems	0.00	256.51	200.00	E
95-ERP-120	Application of High-Resolution Adaptive Numerical Methods to Modeling of Time-Dependent Phenomena in Divertor Tokamak Plasma	0.00	107.03	186.00	E
96-DI-003	Corsica: A Comprehensive Simulation of Toroidal Magnetic-Fusion Devices	0.00	0.00	890.00	E
95-ERP-128	Very-Long-Standoff Penetrator	0.00	310.70	432.00	H
92-SR-030	Structural Acoustics	503.26	0.00	0.00	H
93-SR-037	Advanced High-Explosive–Jet Technology	145.68	0.00	0.00	H
93-DI-024	Janus 2000	480.01	0.00	0.00	H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Energy Technologies					
94-SR-060	Disposal of Plutonium Recovered from Weapons	102.13	0.00	0.00	A
95-ERP-009	Remote Secure Proof of Identity Using Biometrics	0.00	105.14	0.00	A, I
93-DI-007	Confinement and Fusion Neutron Production of Shock-Heated Plasma Rings	469.41	0.00	0.00	A, E
95-ERP-129	Ceramic Waste Containers for Nuclear Waste Disposal	0.00	217.22	118.00	A, B
94-ERP-027	Seismic Base Isolation	147.54	124.35	250.00	B, I
95-ERP-142	The Mechanisms of Creep Fracture in Zircaloy-Clad Spent Fuel Rods at Intermediate Temperatures	0.00	71.95	100.00	B, I
94-ERP-023	Probabilistic Transportation Risk Assessment Integrator Systems Code	24.91	83.55	220.00	A, B, I
92-SR-015	Refuelable Secondary Zinc-Air Electric Vehicle Battery	329.84	0.00	0.00	D
93-DI-014	Electromechanical Battery Research and Development	368.43	0.00	0.00	D
93-DI-021	The Development of Hydrogen as an Economic Nonpolluting Alternative Fuel	287.18	0.00	0.00	D
94-ERP-055	Regenerative Fuel-Cell Systems for Electric Vehicles	130.76	0.00	0.00	D
94-FS-077	Study of a New Passive Magnetic Levitation Concept	25.24	0.00	0.00	D
95-ERP-017	Research and Development on Passive Magnetic Bearings	0.00	95.56	66.70	D
95-ERP-140	High-Efficiency Piston Engine for Automotive and Cogeneration Applications	0.00	122.58	0.00	D
95-LW-065	Studies of a New Approach to Magnetic Levitation	0.00	247.69	230.00	D

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
93-DI-018	Comprehensive Simulation of Toroidal Magnetic-Fusion Devices	733.24	797.90	0.00	E
94-ERP-024	LIDAR Thomson Scattering for Advanced Tokamaks	28.87	72.78	0.00	E
94-ERP-061	Advanced Fusion	111.92	161.62	0.00	E
94-LW-069	Plasma Diagnostic Reflectometry	153.05	187.82	0.00	E
94-SR-022	Physics of Multicomponent Plasmas in Open Magnetic Configurations	80.24	0.00	0.00	E
95-ERP-011	Spheromak and Other Low-Aspect Ratio Magnetic Fusion Energy Experiments	0.00	109.90	150.00	E
95-ERP-141	Petroleum Reservoir Characterization with Electromagnetic Induction	0.00	169.90	0.00	F
94-ERP-019	Development of a Common Software Interface	118.36	84.44	229.90	A, B, I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Environmental & Remediation Technology					
94-ERP-003	Liquid-Cleaning Technology Applications	182.56	151.56	0.00	A, B
94-ERP-032	Mixed-Waste Treatment Technologies	314.30	376.99	0.00	A, B
94-IN-011	An Expanded Porphyrin Approach Toward Transactinium Chelation and the Development of Porphyrin-Coated Optical Fibers as Potential Actinide Sensors	12.28	0.00	0.00	A
96-ERD-067	Integrated Process Technologies for the Treatment of Wastewater: Capacitive Deionization and UV Oxidation	0.00	0.00	164.00	B, I
92-DI-001	Risk Analysis of DOE Waste Sites	97.88	0.00	0.00	B
93-DE-001	Thermally Enhanced Biodegradation of Fuel Hydrocarbons	156.30	0.00	0.00	B
93-IN-016	Cation–Cation Complexes of the Actinides	47.05	0.00	0.00	B, E
93-DE-012	Modeling Subsurface Flow on Massively Parallel Computers	265.20	0.00	0.00	B, F
93-IN-017	Actinide Speciation in Environmentally Relevant Aqueous Solutions and Bioengineering of a Soil Bacterium for the Bioremediation of Transactinium Elements	80.24	0.00	0.00	B
93-SR-085	A Methodology for Assessing the Effect of Mutagens on Aquatic Ecosystem	154.82	0.00	0.00	B
94-ERP-002	Using Shallow, High-Resolution Seismic Reflection Technology to Delineate Contaminant Migration Paths and Barriers to Contaminant Flow and Transport	196.02	170.23	175.50	B
94-IN-010	The Chemistry of Actinide–Mineral Interactions Investigated with Inner-Shell Spectroscopies	82.21	0.00	0.00	B, E
94-LW-105	Bioreduction of Chromium VI in Groundwater with a Naturally Occurring Bacteria	244.55	0.00	0.00	B

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
95-ERI-001	Chemical Speciation of Actinides and Characterization of Solid Phases in Groundwater and Environmental Samples: Uranium and Neptunium	0.00	210.22	135.00	B
95-ERI-002	Novel Complexing Agents for the Efficient Separation of Actinides and Remediation of Actinide-Contaminated Sites	0.00	38.38	0.00	B
95-ERP-028	Enhancing Environmental Restoration Predictive Modeling in Undersampled Environments	0.00	232.17	209.50	B
95-ERP-124	Medium-Scale Physical Model of the Behavior of VOCs in Groundwater Across Fine- and Coarse-Grained Geologic Contacts	0.00	97.29	95.00	B
95-LW-026	Three-Dimensional Measurements of Chemical/Contaminant Transport in Porous Media	0.00	224.12	247.00	B, F
96-ERD-033	Characterization of Toxic Metals in Sediments Using X-Ray Adsorption Spectroscopy	0.00	0.00	218.00	B
96-ERD-059	Reductive Dechlorination of Chlorinated Hydrocarbon Contaminants Using Zero-Valent Reducing Agents and Catalytic Processes: Above-Ground and Down-Hole Applications	0.00	0.00	50.00	B
93-ERD-042	Impact of Climate Change on Terrestrial Vegetation and the Economic and Ecological Implications	271.15	255.31	0.00	E
93-LW-101	Habitat and Environmental Restoration: Investigating Techniques to Restore California Native Perennial Grasses and the Endangered Amsinckia grandiflora	147.70	70.44	0.00	E
94-LW-046	Compact "De-NOxer" for Automotive Exhaust	242.87	249.22	0.00	E, I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Lasers/Electro-optics/Beams					
94-LW-054	Transverse-Structure Electostatic Particle-Beam Lens	156.03	0.00	0.00	A, E
96-ERD-048	Beam Control for Ion Induction Accelerators	0.00	0.00	200.00	A, E
94-ERP-063	Gas-Cooled Diode-Pumped Solid-State Laser	289.07	352.37	0.00	A, H
94-ERP-059	Crosstalk Elimination in Semiconductor Laser Amplifiers and a Polarization-Insensitive Demultiplexer Chip for WDM Optical Communications	315.54	378.96	340.00	A, H, I
96-ERD-003	High Beam Quality Laser Diodes	0.00	0.00	480.00	A, H, I
94-ERP-071	Laser Processing Analysis and Research	296.56	348.98	0.00	A, I
95-ERP-016	Laser Ablative Cutting and Milling of Magnetic Head Structures	0.00	563.76	0.00	A, I
95-ERP-136	Laser Sources for Advanced Manufacturing	0.00	704.41	2000.00	A, I
96-ERD-039	Crystal Growth of Optical Materials for Advanced Lasers	0.00	0.00	382.00	A, I
93-ERP-054	Petawatt Advanced Fusion Project	2779.28	2381.42	0.00	A, E
93-ERP-075	Diagnosing Fast-Evolving, High-Density Laser Plasmas Using X-Ray Lasers	497.87	527.33	0.00	A, E
94-LW-085	Waveguide Fabrication of 1.3-μm Crystal Amplifiers	276.95	247.54	0.00	A, E, I
96-DI-011	Petawatt/Fast Ignitor Irradiation System	0.00	0.00	3000.00	A, E
96-ERD-021	Precision Manufacturing Using Advanced Optical Interference Lithography	0.00	0.00	382.00	A, I

FY94-96 LDRD-Funded Projects
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Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
96-ERD-051	Radiatively Heated Hydrodynamics	0.00	0.00	150.00	A, E
93-SR-009	Compact, Kilowatt-Scale Q-Switching of Diode-Pumped Solid-State Lasers	293.08	0.00	0.00	C, E, H
93-DI-044	Ultrahigh-Gradient Dielectric Wall Accelerator	464.42	806.90	0.00	C, E
92-DE-019	X-Ray–Laser–Based Biological Microimaging	198.11	0.00	0.00	E
95-ERP-143	LLNL Medical Isotope Enrichment: Large-Volume, Low-Cost Production through Advanced Technologies	0.00	654.06	1000.00	E
96-ERD-006	Military Vision Project	0.00	0.00	336.00	C, H
96-LW-005	Tunable Diode-Pumped Solid-State Laser for Scalpel with Adjustable Penetration Depth	0.00	0.00	250.00	I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Manufacturing Processes & Technology					
94-ERP-068	Efficient Polishing of Aspheric Optics	220.47	271.62	245.00	A, I
95-ERP-003	Electromagnetic Simulation of Electronic Packaging Designs	0.00	224.66	0.00	A, I
96-ERD-009	Surface Morphology Evolution in Silicon During Ion Beam Processing	0.00	0.00	200.00	A, I
96-ERD-053	Thin-Film Transistor Printing	0.00	0.00	405.00	A, I
96-ERD-074	Electron Beam, Vapor Phase Manufacturing	0.00	0.00	500.00	A, I
96-ERD-075	Precision Laser Cutting and Drilling with Advanced Solid-State Lasers	0.00	0.00	500.00	A, I
96-LW-049	Liquid Crystal Display Demonstration	0.00	0.00	250.00	A, I
92-SR-024	Cheap Laser Diodes	388.27	0.00	0.00	A, C, H, I
95-DI-012	Metrology of 13-nm Optics for Extreme Ultraviolet Lithography	0.00	483.90	211.10	A, I
95-ERD-009	Superplasticity in Aluminum Alloys	0.00	159.88	150.00	A, I
95-ERP-130	Pulsed Laser Deposition of High-Value Coatings	0.00	383.36	500.00	A, E, I
96-ERD-005	Integration of Adaptive Process Control with Computational Simulation for Spin-Forming	0.00	0.00	342.00	A, I
96-ERD-016	Uranium Alloy Forming Process Research	0.00	0.00	284.00	A, B
96-ERD-040	Rapid Compensation of Volumetric Errors on a Machine Tool or Robot	0.00	0.00	34.40	A, I
95-ERP-015	Hard Carbon Field Emitters for Flat-Panel Displays	0.00	238.47	0.00	A, H, I
95-ERP-018	Aspheric Optics for Extreme Ultraviolet Lithography	0.00	667.46	0.00	A, I
96-ERD-004	Advanced Deep Ultraviolet Systems for Lithography	0.00	0.00	480.00	A, I

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Materials Synthesis & Characterization					
93-DI-015	Aerogel-Based Electronic Devices	387.48	0.00	0.00	A, E
93-DI-036	Molecular-Level Studies of Energetic Materials	486.65	938.36	0.00	A, H
94-FS-041	Demonstration Model Circuit Panel for Silicon-on-Insulator Microelectronics and Flat-Panel Displays	18.86	0.00	0.00	A, H
94-SR-034	Research on Materials Processing with High-Radiance Lasers	290.01	0.00	0.00	A, I
94-DE-046	Development of a Silicon on Plastic Thin-Film-Transistor Technology for use in Flexible, Active Matrix, Liquid Crystal Displays	124.08	0.00	0.00	A, H, I
92-DE-002	Nanoscale Lithography Induced Chemically or Physically by Modified Scanned Probe Microscopy	158.85	0.00	0.00	A, I
92-DE-004	Fundamental Studies of Particle–Solid Interactions	173.59	0.00	0.00	A, I
92-DE-005	Ductile-Phase Toughening of Refractory Metal Intermetallics	116.09	0.00	0.00	A, I
93-DE-016	Solid-State Amorphization at a Crystalline Interface	114.89	0.00	0.00	A, I
93-DE-056	Cooling of Materials Subjected to Intense Heating	65.64	0.00	0.00	A, I
93-LW-014	Frequency Domain Analysis of the Parasitic Vibrations Emitted by Damaged Materials and Structures	106.04	0.00	0.00	A, I
93-LW-060	Quantum-Well, Semiconductor, Blue and Near-Ultraviolet Light Source	239.54	0.00	0.00	A, I
94-DE-040	Enhanced Thermoelectric Materials	227.10	0.00	0.00	A, I

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FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
94-ERD-017	Giant Magnetoresistance Materials with Novel Spacer Layers	206.86	205.55	72.00	A, I
94-ERD-022	Bonding and Structure of Nanocrystalline Thin Films	179.15	186.80	150.00	A, I
94-ERD-048	Studies of Meso-Structural Features in High-Tc Superconducting Materials Using Pair Distribution Function Analysis of Neutron/X-Ray Scattering Data	107.55	326.72	250.00	A, I
94-LW-062	New XAFS Spectroscopic Investigations in the 1- to 2-keV Region	203.04	226.03	0.00	A, I
94-LW-071	Molecular-Scale Study of Growth Dynamics During Crystallization From Solution	209.33	0.00	0.00	A, I
95-DI-010	Physics-Based Multiscale Models of Materials Properties and Performance: Pioneering the Multilength Scale Problem	0.00	389.44	0.00	A, I
95-ERD-006	Electroluminescent Polymers	0.00	180.00	225.00	A, I
95-ERD-008	A Novel Approach to SiC Film Production for Micromechanical and Electronic Components	0.00	208.91	200.00	A, I
95-ERD-038	Organic Light-Emitting Diodes	0.00	350.78	473.00	A, I
95-ERP-144	Molecular-Scale Study of Growth Dynamics During Crystallization from Solution	0.00	224.19	180.00	A, I
96-ERD-018	Accelerated Stress Rupture Lifetime Assessment for Fiber Composites	0.00	0.00	206.00	A, I
96-LW-090	Investigation of Fullerenes for High-Speed, Low-Latency, Photonic Switching	0.00	0.00	196.00	A, I
94-ERD-019	Evolving Microstructure: Mechanisms of Electromigration in Stressed Aluminum–Copper and Copper Films	253.64	129.09	0.00	A, I

FY94-96 LDRD-Funded Projects
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Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
94-LW-033	Investigating the Potential Utility of Molecular Traps for Concentrating and Immobilizing Hazardous Substances	124.72	0.00	0.00	B, A
96-ERD-026	Strengthening Mechanisms in Ultrahigh-Strength Steel Wires	0.00	0.00	144.40	A, I
94-DI-001	High-Density Reactor Development for Large-Area Plasma Processing	1135.52	1593.50	800.00	A, I

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Nuclear/Atomic Science & Technology					
95-ERD-040	Mapping of Enhanced Nuclear Stability near the Deformed Shells N = 162 and Z = 108	0.00	215.96	210.00	A, E
96-DI-006	Enhanced Monte Carlo Transport Modeling for Radiation Therapy and Wapons Applications	0.00	0.00	1600.00	A, I
93-ERD-052	Interactions of Electrons with Very Highly Charged Ions	417.39	481.51	0.00	A, E
93-ERD-027	Ion Cooling, Charge Transfer, and Coulomb Crystals with Trapped Highly Charged Ions	360.75	502.89	0.00	A, E
93-IN-018	Two-Photon Spectroscopy of the Actinide Ions Cm(3+) and Am(2+)	21.81	0.00	0.00	A, E
93-LW-085	Relativistic Configuration Interaction Calculation of the Correlation Energies of Highly Ionized Many-Electron Atoms	124.46	0.00	0.00	A, E
94-ERD-031	Absorption and Heat Transport in Plasmas Produced by Femtosecond Optical Lasers	112.29	143.11	0.00	A, E
94-ERI-002	Ion Plasma Waves	325.94	254.15	0.00	A, E
94-ERI-009	Study of Electron-Capture Delayed Fission in Am-232	52.53	31.20	0.00	A, E
94-LW-008	Production of Subfemtosecond Light Pulses	256.93	236.94	0.00	A, E
94-LW-025	Cold-Ion Spectroscopy	113.78	140.29	0.00	A, E
96-DI-004	Next-Generation Detonics	0.00	0.00	1000.00	A, E
96-ERD-038	Quantum Electrodynamic Corrections to the Energy Levels of Many-Electron Ions	0.00	0.00	99.00	A, E
96-ERD-046	Development of Laser-Plasma Diagnostics Using Ultrafast Atomic-Scale Dynamics	0.00	0.00	430.00	A, E

FY94-96 LDRD-Funded Projects
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Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
96-ERD-052	Studies with Highly Charged Ultra Cold Ions: Binary Ionic Mixtures	0.00	0.00	360.00	A, E
96-ERD-062	Gamma-Ray Identification of Nuclear-Weapon Materials	0.00	0.00	275.00	A, C
94-DE-004	Determination of Plutonium Metal Origins	95.18	0.00	0.00	C
92-DE-088	Heavy Ion Physics at the Brookhaven Alternating Gradient Synchrotron	376.94	0.00	0.00	A, E
94-DI-008	Advanced Accelerator and Detector Technology	1159.21	1925.94	1943.00	A, E
95-ERD-037	Searching for Strange Matter	0.00	392.73	537.00	A, E
95-ERD-039	A Systematic Study of the Nuclear Matter Equation of State	0.00	339.96	0.00	A, E
96-LW-061	Implementation of a Large-Scale Dark-Matter Axion Experiment	0.00	0.00	228.00	A, E
92-DE-021	Nuclear Matter at Extreme Temperatures and Densities: An Experimental Approach	374.15	0.00	0.00	A, E
96-ERD-072	Extended Solids High Energy Density Materials Synthesis	0.00	0.00	450.00	A, H

FY94-96 LDRD-Funded Projects
Lawrence Livermore National Laboratory

Tracking Code	Project Title	FY1994 $K	FY1995 $K	FY1996 $K	Programmatic Areas Supported
Space Science and Technology					
94-ERD-030	Hydrodynamics and Nucleosynthesis in Neutron Stars, Supernovae, and the Early Universe	243.39	178.08	0.00	A, I
93-IN-056	The Explosive Origins of Galaxies	315.10	0.00	0.00	A, I
94-LW-001	Radiation Transport for Coalescing Neutron-Star Models of Gamma-Ray Bursts	54.36	0.00	0.00	A, I
92-IN-024	Phase Dynamics in the Early Universe	296.97	0.00	0.00	A, I
95-ERI-005	Structure of the Giant Planets	0.00	87.81	0.00	A, I
95-ERI-006	The Nature and Evolution of Quasars	0.00	314.42	420.00	A, I
95-ERI-008	The Highest-Energy Phenomena in the Universe	0.00	286.76	380.00	A, I
92-IN-010	Planetary Hydrogen	115.09	0.00	0.00	A, I
95-LW-010	A Gamma-Ray Burst and Particle Detector for the Mars Surveyor Mission	0.00	179.11	198.00	C, H
96-ERD-044	Very Fast Control and Response in Astronomy	0.00	0.00	595.00	C, H
95-ERP-138	Clementine In Cyberspace	0.00	47.90	0.00	A, C, H
94-DI-007	Application of Adaptive Optics to Astrophysical Observations	3305.53	1613.61	1300.00	C, E, H
92-LW-010	Plasma Thruster: Experimental Results	248.84	0.00	0.00	I
	TOTAL LDRD FUNDING	$52,039	$50,901	$49,132	

Project Coding
Programmatic Areas for LDRD

A = Defense Programs
B = Environmental Management
C = Non-Proliferation and National Security
D = Energy Efficiency and Renewable Energy
E = Energy Research
F = Fossil Energy
G = Nuclear Energy
H = Department of Defense
I = Other

Los Alamos National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Los Alamos National Laboratory

Laboratory Directed Research and Development Program (LDRD)

Project Listing for the Fiscal Years '94 through '96

(prepared March 19, 1996)

Because projects are exploring the frontiers of science and technology they are generally multi-purpose in nature and support several programmatic areas

The few most significant areas of DOE programmatic support are identified by the following code

A - Defense programs
B - Environmental management
C - Non Proliferation and Nuclear Safeguards
D - Energy Efficiency and Renewable Energy
E - Energy Research
F - Fossil Energy
G - Nuclear Energy
H - Department of Defense
I - Other

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
90043	Advanced Free-Electron Laser	800			EH
92001	An Array Signal Processing Approach to Brain Functional Imaging	200			EI
92002	Technetium Chemistry	409			AB
92003	Electromagnetic Collapse of a Highly-Radiating Current-Carrying Plasmas (Radiation Collapse)	95			AGI
92004	Anomalous Nuclear Products From Deuterided Metals	195			DE
92005	Nanofabrication	255			EH
92006	Thin Film Micro-electrochemical Sensor Development	210			BH
92008	Lunar Surface Composition Using an Orbital Ion Mass Spectrometer	60			CE
92009	Interpreting Observations of Neutron Stars	70			E
92010	High Resolution Paleoclimate Studies via RIMS	95			ABE
92011	Application of Seismic Coda Wave Methods to Nuclear Explosion Yield Estimation and Discrimination Problems	95			AC
92012	The Basis Of Dynamic Compensation Of Ionospheric Phase In Synthesis Radio Telescopy	80			CE
92013	Liquid Crystal Thermosets	200			EH
92014	Neutron and Resonant X-Ray Scattering by Materials	350			AE
92015	Structural and Electronic Competitions in Low-Dimensional Materials	300			ABE
92016	Monte Carlo Variance Reduction Techniques for Collective Multiparticle Events	180			AE
92017	Advanced Adaptive Computing: Algorithms, Architectures, and Applications	200			AE
92018	Research Into Newly Observed Waves In Plasma Supported By ExB Drift	173			ACE
92019	Plasma Process Modeling	217			AE
92020	A Novel High-Power Microwave Source	85			EH
92021	Non-equilibrium Plasma Combustion of Hazardous Organic Compounds	152			BCI
92022	Fusion Nuclear Technology Initiative	25			EG
92023	New Techniques for Interfacial Imaging	197			AE
92024	Laboratory Measurements of Heterogeneous Reactions on Stratospheric Aerosols Implicated in Ozone Depletion	135			BCE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
92025	Medical Applications Of Lasers And Optical Technology	300			EI
92026	The Rapid Formation of Unique Structural Components by Fusing Airborne Particles in a Laser Beam	340			AB
92027	Global Climate Research	250			ACE
92032	Third Year Continuation of Distributed AWACS	40			AH
92034	Controlled, Structural, Rigid Plastic Foam Fabrication	300			BH
92035	Final State Effects and Correlation in Atomic Systems	300	35		E
92036	Radiative and Collisional Interactions of Atoms	120			AE
92037	Kinetic X-ray Crystallography on Photolyzed Carbonmonoxy Myoglobin	225			EI
92038	G-Proteins as Regulators of Intercellular Communications	200			EI
92040	Stopped-Flow Flow Cytometry	187			EI
92042	Effects Of Amino Acid Substitutions On The Structure, Stability & Function Of A Protein	260			EI
92043	Developing An Interactive Graphic Tool For DNA Modeling	55			EI
92044	Growth-Related Transcriptional Regulation of the cdc2 Gene	200			EI
92046	Superfluid Stirling Refrigerator	105			DE
92047	Fundamental Aspects of Photoelectron Spectroscopy in Correlated Electron Systems Utilizing Synchrotron Radiation	300			EH
92048	Universal Turing Machines, Lattice Gases and Critical Behavior	55			AE
92049	Analysis and Numerical Modeling of Ocean Dynamics	180			ACE
92050	The Theoretical Basis for Tracking Detonation Waves Principle	100			AC
92051	Symplectic Integration Algorithms	100			AE
92052	RHIC-LAMPF Physics	295			AE
92053	Research In Elementary Particles And Field Theory	664			AE
92054	Mesoscale Methods for the Prediction of Strong Plasma Turbulence Effects in Macroscopic Systems	155			CE
92055	Intense Ion Beam Development for Bulk Deposition of Crystalline Films	400			EH
92056	Advanced Material Science Algorithms for Supercomputing Architectures	50			AE
92059	MILAGRO: A Broad-Based Detector for High-Energy Cosmic Gamma-Ray Astronomy and Physics	25			AE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
92060	Los Alamos Neutron and Time Reversal Program	270			AE
92070	Acousto-optic Devices in Semiconductor Quantum Wells	210			EH
92213	Low-Temperature Stm for Structural & Spectroscopic Studies of High Temperature Superconductors & Other Electronic Materials	50			AE
92214	Materials with Fine Microstructures	380			AE
92215	Ion Beam Materials Research	430			EH
92219	Neutron Reflection Studies of Thin Film and Multilayer Structures	90			EH
92221	Development of Samarium Doped YAG as a Pressure/Temperature Standard	64			EH
92223	The Dynamics of Amorphous Materials	166			EH
92224	Pattern Formation and Coherent Structures	145			AE
92225	Numerical Algorithms in Scientific Computing	129			AE
92226	Chaos and Complexity in Simple Dynamical Systems	145			AE
92227	Computational Biology	146			EI
93001	Multiphoton Processes In Intense Electromagnetic Fields	100	95		EH
93002	Non-Linear Interactions of X-Rays With Atoms	340	291		AE
93003	Determination of Interionic Potentials in Molecules	80	76		ABE
93051	New Approaches For Quantum Chemical Calculations on Very Large Molecules	240	227		ABE
93052	Quantum Resonance Effects In Exchange, Photodissociation, And Recombination Reactions	275	260		EF
93053	Metal Vapor Synthesis in Organometallic Chemistry	235	222		BE
93054	Separations Chemistry of Toxic Metals	250	238		BCI
93055	Multifunctional Self-Assembled Monolayers	200	190		BEH
93101	Fast Events in Protein Folding	230	219		EI
93102	Positional Cloning of Disease Genes on Chromosome 16	175	166		EI
93103	Structural Determination of Larger Proteins Using Stable Isotope Labeling and NMR Spectroscopy	220	209		EI
93104	Directly Labeled Fluorescent DNA Probes for Chromosome Mapping	235	190		EI
93105	Predicting B-DNA Duplex Structure From Sequence	140	132		EI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
93106	Theoretical Studies of the Interaction of Water with DNA Oligomers and Proteins.	200	189		EI
93151	Polymers For Integrated Optics	276	253		AH
93152	Optical-Fiber Laser Amplifier for Ultrahigh-Speed Communications		261		AH
93153	Generation of High-Power, Subpicosecond Submillimeter Radiation for Applications in Novel Device Development and Materials Research	287	247		EH
93154	High Temperature Materials Synthesis Without Heat: Oxide Layer Growth on Electronic Materials Using High Kinetic Energy Atomic Oxygen	164	154		EH
93155	Large Dynamic Range, Picosecond Resolution Radiation Detection Based on Low Temperature Grown Epitaxial GaAs Films	91	86		EH
93156	Instrumentation for High Efficiency - High Sensitivity Actinide Analysis	117	111		BC
93157	Generation of Intense Electromagnetic Radiation With Explosively Driven Piezoelectric Material	325	288		CH
93164	Development of Multimode Neutron-Noise Theory		6		EG
93201	Cosmological Gamma-Ray Bursts	90	86		CE
93202	A Study By Computer Simulation Of The Generation And Evolution Of The Earth's Magnetic Field	182	173		AE
93203	Mineralogical and Geochemical Aspects of Mineral-Induced Disease	149	142		EI
93204	Spacetime Geodesy: The Lageos Satellite Experiment	95	90		CE
93205	Macroscopic Time and Altitude Distribution of Plasma Turbulence Induced in Ionospheric Modification Experiments	75	71		CE
93206	Galactic/Globular Pulsar Content and the 2.1 ms Pulsar Candidate in SN1987A	90	86		E
93207	Magnetic Reconnection in Space Plasmas	80	76		CE
93208	A Coupled Regional Climate-Biosphere Model for Climate Studies	118	112		ABE
93209	Measuring the Magnetic Connectivity of the Geosynchronous Region of the Magnetosphere to the Auroral Zone	80	76		CE
93210	Atmospheric Aerosol Chemistry Analyzer: Demonstration of Feasibility	125	118		CH
93211	Resolving the Excess Ar Problem in the Dating of Young Volcanic Rocks	86			BE
93212	Stochastic Imaging of Oil and Gas Reservoirs	90	86		EF

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
93215	Effect Of Water Vapor And Aerosol Content Above The Ocean On The Sea Surface Temperature Regulation Mechanism	5			BCE
93251	Dynamic Deformation of Advanced Materials	635	603		AH
93252	Strain Measurement in Individual Phases of Multiphase Materials during Thermo-Mechanical Loading--Aspects not Related to Neutron Scattering	130	124		AH
93253	Artificially Structured Nonlinear Optical and Electro-Optic Materials	465	442		EH
93254	Structural Phase Transitions in Non-Stoichiometric Oxides and Other Materials	275	261		ABE
93255	Strongly Correlated Electronic Materials	495	467		AE
93258	Massively-Parallel Tools for Studying Microstructural Evolution	23			AE
93301	Multidimensional Methods for Hyperbolic Problems	115	108		AE
93302	Theoretical and Numerical Tools for Advanced Semiconducting Devices	135	127		EH
93303	Hard Chaos, Quantum Billiard, and Quantum Dot Computers	80	76		EH
93304	Development of the Applied Mathematics Originating From the Group Theory of Physical and Mathematical Problems	135	127		AE
93305	A New Class of Random Number Generators	135	128		AEI
93306	Wavelet Theory and its Applications	135	128		AE
93307	Applied Mathematics of Chaotic Systems	145	137		AE
93313	Multi-Constraint Shield Design Optimization Method	35			EG
93314	Computational Methods for Even-Parity Transport Theory in Nuclear Reactor Physics	40			AG
93321	Computer Simulation of Large Organizational Systems	250			CE
93352	Neutrino Masses and Properties	1065	864		E
93353	Theoretical Research Relevant to Medium Energy Upgrades and Experiments	425	402		AE
93354	Development of Radioactive Beams at LAMPF for a High Precision Test of the Standard Model and as a Step Towards ISL	165	157		E
93355	Research In Baryon Number Violation At The SSC	50	48		E
93401	Turbulent Scaling in Fluids	245	233		AE
93402	Dusty Plasmas	194	184		EH
93403	Plasma Immersion Ion Implantation for Semiconductor Film Growth	261	236		BEI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
93404	New Mechanism for Lightning Initiation	85	81		CH
93406	Investigation of Charge Transport and Electromagnetic Effects in Advanced Microelectronics and Optoelectronics	260	247		EH
93551	Properties of Kondo Insulators in High Magnetic Fields	230			E
93553	Lattice Coupling to Electronic and Magnetic Instabilities in High Magnetic Fields	80	80		AE
93554	Heavy Fermions in High Magnetic Fields	80	80		E
93556	Bulk And Surface Electronic Structure Of Actinide, Rare Earth, And Transition Metal Elements And Compounds	50	50		AB
93601	Applications of Mathematical Analysis of Nonlinear Physical Systems	143	164		ABC
93602	Mesoscale Ocean Dynamics Modeling	138	139		AE
93603	Theoretical Issues in Nanotechnology	123			EH
93651	Analysis of Structure and Orientation of Adsorbed Polymers in Solution Subject to a Dynamic Shear Strass	134	243		ABE
93652	Development of Pair Distribution Function Analysis to Meso-Structural Details in Single Crystal Perovskites, etc. and Nanocrystalline Materials	64	132		BE
93653	Neutron Scattering as a Probe of the Structure of Composite Materials	114	237		AE
93655	A New Approach To Texture Measurements: ODF Determination By Rietveld Refinement	76	158		AE
93701	Accelerator Driven Intense Neutron Source Technology and Application	2300	617		AE
93704	Development of an Experimental and Theoretical Structural Biology Project	1250	513		EI
93706	Nanoscience and Technology: An Interdisciplinary Program Development Initiative	1500	423		EI
93707	High Temperature Superconductivity Initiative	1790	310		EH
93708	Advanced Laser Remote Sensing	500	275		BCH
93713	High Luminosity Hadron Collider Physics Research Initiative	225			E
93719	Megagauss Technology And Pulsed Power Applications	1000	757	21	ACI
93801	Advanced Satellite Sensors: Low Energy Neutral Atom (LENA) Imager and Near Infrared Camera (NIC) Imager		90		CE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
93803	Development of Experimental Techniques to Study Protein and Nucleic Acid Structures		309		EI
93804	Self-Assembling Nanoscale Quantum Devices		497		EH
93805	Sub-Surface Characterization and Three Dimensional Profiling of Semiconductors by Magnetic Resonance Force Microscopy		265		ABE
93806	Development of the Accelerator-Driven Energy Production Concept		441		ABG
93807	Separations Technology Development for Accelerator Transmutation Technology Concepts		706		ABC
94011	Phase Stability of Transition Metals and Alloys	180	149	128	ABI
94026	L3 Physics at the Z Resonance and a Search for the Higgs Particle	150	128	107	E
94031	Antiquark Distributions in the Proton	200	187	142	E
94038	The Preparation and Utilization of 13C and 15N Labeled DNAs for the Determination of Unusual DNA Structures Relevant to the HGP by NMR Spectroscopy	230	219	163	EI
94041	Metal-Ligand "Multiple" Bonding: Revelations in the Electronic Structure of Complexes of High-Valent f-Elements	200	183	142	BE
94043	Binding of Hydrocarbons and Other Extremely Weak Ligands to Transition Metal Complexes that Coordinate Hydrogen	250	229	178	EF
94046	Chemistry and Catalysis in Supercritical Media: New Environmentally Sound Approaches to Chemical Synthesis and Processing	385	356	266	ABI
94047	Photoredox Reactions: Energy Storage and Halocarbon Degradation	205	196	148	EF
94058	Developing Electron-Beam Bunching Technology at Subpicosecond Pulse Lengths for Improving Photon Sources	200	186	143	AH
94071	High-Duty-Factor H- Ion Source Extraction Physics	85			AE
94073	Lead Immobilization in Thermally Remediated Soils and Igneous Rocks	120	114	84	BE
94074	Magmatic Tritium	132	125	92	AE
94077	Using Microspheres as Tracers for Flow in Geologic Media	125	119	87	BF
94081	Integrating Chemistry in 3-D Climate Models: Detailed Kinetics in the Troposphere and Stratosphere of a GCM	144	127	93	BC

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94092	Adaptive Composite Overlapping Mesh Algorithms on Message Passing Parallel Architectures	216	205	154	ACI
94101	Industrial Processing of Complex Fluids: Formulation, Modeling, and Algorithms	50	48	36	BDI
94102	Parallel 3-D Spherical-Harmonics Transport Methods	155	147	110	AG
94104	Experimental Studies of Auroral-Arc Generators	100	95	71	CE
94107	Particle Acceleration from Reconnection in the Geomagnetic Tail	70	67	50	CE
94115	Remote Sensing of Thundercloud Electric-Field Airglow	55	52	39	CH
94116	Dispersive Water Waves In One And Two Dimensions	111	104	79	ABE
94120	Modeling Mesoscopic Phenomena in Extended Dynamical Systems	91	86	59	DE
94121	Mimetic Difference Approximations of Partial Differential Equations	100	95	71	AE
94124	Wavelet Transforms as Solutions of Partial Differential Equations	307	219	165	AH
94125	Studies of Structure of Turbulence by High Resolution Simulation and Theory	165	156	94	AE
94130	Non-Perturbative Estimates Of The Standard Model Parameters	75	71	53	E
94131	Nonequilibrium Dynamics Of The Quark-Gluon Plasma In Heavy Ion Collisions	125	118	83	E
94135	Turbulence and Turbulence Spectra in Complex Fluid Flow	250	237	179	AE
94143	Optimal Screening Designs for Biomedical Technology	260	246	185	EI
94147	Computer Simulation of Protein Solvation, Hydrophobic Mapping, and the Oxygen Effect in Radiation Biology	120	113	72	E
94158	Experimental Cosmology: The Early Universe After Cobe	200	189	142	E
94159	Accretion Onto Black Holes: The Power Generating Mechanism	120	113	85	AE
94173	Plasmasphere Refilling: New Numerical and Observational Tools	88			CE
94195	Flare Star Monitoring With A New Single Photon Counting Imaging Detector	80	76	57	CE
94201	Applications Of Strand-Specific In Situ Hybridization	224	213	158	EI
94205	Development of an Ultrasensitive and Rapid DNA Repair Assay	179	170	126	EI
94214	Engineering Sequence-Specific RNA And Single-Stranded-DNA Binding Proteins	250	264	177	EI
94218	Rigid Molecular Foams	180	166	127	AB

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94220	Ionically Conducting Polymers for High Energy Density Batteries	270	257	192	DH
94232	Synthesis and Characterization of New Fullerene-Based Mixed Materials	35			EH
94239	New Applications for Zeeman Interferometry	110	105	78	EH
94242	Development Of New And Efficient Hard Rock Mining Methods Using Pulsed Laser Excavation	249	237	177	DE
94245	Application of Intense Surface Discharge Light Sources to Photoresist Ashing in Semiconductor Manufacturing	293	278	208	BCE
94255	State-to-State Photodetachment In The Two Electron Hydrogen Ion	145	134	129	EI
94265	Free-Electron Laser Photolysis of Chlorofluorocarbons	38			BE
94266	Ultra-Tough Ultrasonic Transducers and Robust Algorithms for Resonant Ultrasound Spectroscopy	200	60		AH
94268	Value Analysis Technology Development for R&D Environments	65	100		EI
94269	How To Safeguard, Increase The Utility Of, and Reduce The Cost Of Refrigerated Blood	225			EH
94270	Measuring Air Quality Components with Light Detection and Ranging in the El Paso/Juarez Airshead	25			EF
94271	Optical Spectroscopy of Porous Silicon	100	200		BE
94272	Structure-Activity and Mechanism of Titanasilicozeolite Catalyzed Oxidation Reactions	100			BE
94273	Flow Cytometric Assessment of Gene Products	100			EI
94274	On-Line Energy Diagnostic For Accelerator Beams	60			AE
94275	Evaluation of High-Speed Bump Magnets for Direct Injection into Accumulator Rings	170			AE
94276	Theoretical Investigation of the PSR Instability	150			AE
94277	Studies and Evaluation of High Brightness H- Ion Source Concepts	350			AE
94278	Development Of A RAMI Model For High Power Accelerators	100			AE
94279	Beam Diagnostic Tomography	65			AE
94280	Intense-Ion Beam Processing	60			EH
94281	Development of Bragg Scattering Apparatus for Ultra Cold Neutrons	80			AE
94283	Prototype Quantum Cryptography System	80			CH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94284	Biomorphic Autonomous Machines	60			CH
94286	Biomedical Optics	70			EI
94287	Landsat-like Satellites for Ecological Surveys	50	100		CE
94288	Laboratory X-Ray Source	50			AEI
94289	Air Quality Monitoring and Research	50			BF
94290	High Speed Bone and Joint X-Ray Imaging	60			EI
94291	Review of Gamma-Ray Laser	50			EH
94292	Molecular Assemblies on Semiconductor Surfaces: Molecular Engineering of Photonic Devices	50			EH
94293	Chemically-Enhanced Laser-Based Imaging	50			CE
94294	Data Embedding Research		50		CE
94295	4-Cell Superconducting Cavity Test	30			AE
94296	Laser Induced Damage on Soft Tissue Using the AFEL	30			EHI
94297	Design of Ultra-High Brightness Electron Sources in Support of NLC and TESLA	50			EI
94298	Development of a CW Proton Test Stand	140			AE
94299	New Technology LANSCE Controller Demonstration	90			AE
94401	Advanced Simulation and Analysis Capabilities for Transportation	255			DEH
94402	A Concurrent Engineering Approach to New Materials Deployment for Clean Car Development	150			DE
94406	Reactor Safety Enhancement for the Former Soviet Union	400			CG
94407	Modeling and Simulation in Semiconductor Technology	800	358		AE
94411	Thermoacoustic Natural Gas Liquefier	150	135		DE
94418	Cutting Mechanics: The Fundamental Principles of Machining	200			AH
94421	High Performance Computing for Domestic Petroleum Reservoir Simulation	499	248		EF
94426	Advanced Solid-State-Laser LIDAR	400	113		CH
94427	Vulnerability Assessment of Theater Missiles to Terminal, Mid-course, and Boost-phase Defensive Systems	500			H
94428	Integrated Theater Missile Defense Simulation	310			AH
94430	Intelligent Controllers for Battlefield Simulations	200	237	225	AH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94445	Environmental Characterization And Sensors	900	359		CH
94448	Chemical Conversions in Supercritical Media: Environmentally Sound Approaches to Processes and Materials	250	223		BC
94450	Integrated Waste Treatment for Metal and Organic Legacy Wastes	500	450	209	BC
94451	Parallel Implicit Low-Speed Flow Hydrodynamics	250	225	188	EF
94455	A Predictive Ocean Oil Spill Model	173	90		EF
94457	Biomedical Applications of Single Molecule Detection	725	600	499	CH
94466	A High Power Accelerator Driver System For Spallation Neutron Sources	830	360		AE
94470	Heterogeneous Institutionally-Integrated Intelligent Information Infrastructure	2500	1000		CH
94475	Porous Inorganic-Organic Hybrid Polymers for Chemical Separations	125			AB
94476	Country-Specific Proliferation Analysis	175			AC
94477	Systems-Analysis for Counterproliferation	325			AC
94479	Molecular Medicine for the 21st Century: A Computational Basis for Design and Critiques of Vaccines and Therapeutics	500	588	243	EI
94481	Pre-Stack Migration of Three-Dimensional Seismic Data	311	135		CB
94482	Coupled Transport and Chemical Interactions in Petroleum Reservoirs: Multicomponent Tracer Large Scale Application Demonstration	217	85		EF
94483	A High-Intensity Proton Accumulator Ring	1100			AE
94484	Spallation Neutron Source Target Systems	970	353		AE
94487	Optimization Of Ferroelectric Thin Films For Microelectronics Applications	125			EH
94489	Semiconductor Manufacturing Process Water Model	20			BE
94501	Benchmarking Ocean Circulation Models on Massively Parallel Computers	75	68		AE
94502	Adaptive Mesh Refinement Algorithm Development and Dissemination	150	135	101	AEG
94503	Neutron Transport Methods for 3D Cartesian Adaptive Meshes	75			AEG
94504	Lie Group Applications to the Solution of Differential Equations	75	68	51	AEG
94506	Characterization of Advanced Electronic Materials	234	211	157	EH
94507	Physical Properties and Mantle Dynamics	107	176	118	BE
94508	Neutron Star Evolution and Emission	154	158	140	E
94509	Lithospheric Processes	177	175	123	BE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94610	Modeling The Heat Flow And Resulting Dynamics In The Earth's Interior	185	161	114	ABE
94611	Transport Processes in Space Plasmas	96	70	147	EI
94612	Numerical Methods Based on Nonlinear Dynamics for Modeling the Global Ocean	75	75	100	AE
94613	Studies of Dynamical Processes Affecting Global Climate	106	135	140	CE
94614	Lattice Boltzmann Research	161	159		EF
94615	New Initiatives in Nonlinear Problems	141			AE
94616	Nonlinearity in Novel Electronic and Structural Materials	129	199	235	EH
94617	Nanometer Scale Materials: Semiconductors to Fullerenes	200	180	134	EH
94618	Liquid Ion Beam Processing of Advanced Materials	225			AH
94619	Advanced Deformation Process Modeling	405	394	180	AH
94620	High Resolution Electron Microscopy Of Materials	380	369	300	AE
94622	Application of Discrete Mathematics	250	225	169	AI
94623	Measurement By Neutron Diffraction Of Strains In Advanced Engineering Structural Materials Including AlSiC And AlTiC	168	232	118	AH
94624	Fabrication of Boron-Phosphide Neutron Detectors	128	264		CG
94625	Formation Of Drug-Bearing Vesicles In Mixed Colloids Of Bile Salts And Phosphatidylcholine	128	100	143	EI
94627	The Implications of Diffraction in-situ Loading Macro-Strain Measurements in Composites and Finite Element Interpretations	79	138	75	AH
94628	Design and Implementation of an X-Ray Strain Measurement Capability Using A Rotating Anode Machine	258	417	217	AH
94630	Characterization of Active Sites in Zeolite Catalysts	136	264	144	BC
94632	A Thermodynamically Consistent, Damage-Dependent, Interface Debonding Model for Composites	45	41	31	AHI
94633	EOS, Thermodynamic and Structural-Mechanical Properties of Intermetallic Compounds	45	41	31	AEI
94634	Alloy Design and Phase Stability of the Ternary Alloy Ti-Al-Nb	66	59	38	AE
94635	Modeling Complex Phenomena: Multiple Length and Time Scales in Extended Dynamical Systems	75	68	50	AEH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94636	Cluster Dynamics	75			AE
94637	Phase Transitions, Nonequilibrium Dynamics, And Critical Behavior Of Strongly Interacting Systems	75	68	51	AEH
94638	Lattice Gas and Molecular Dynamics for Multiscale Phenomena in Complex Fluids	75			AE
94639	Computational Methods for Multiple Space and Time Scales	75			AE
94640	Scanning Probe Microscopy Competency Development	255	255	200	AE
94642	Experiment to Explore the Nature of Upward Lightning	20			CE
94803	Development of a Low Level In-Line Alpha Counter (LLILAC)	257			CG
94804	Image Processing Technology	309			CH
94901	Detection of Arsenic by Resonance Ionization Mass Spectrometry	25	25		CE
94902	Chemical And Physicochemical Properties of Submicron Aerosol Agglomerates	34	39	34	BH
94903	Analysis and Visualization of Global Magnetospheric Processes	25		25	EH
94904	Advanced Biomolecular Materials Based on Membrane-Protein/Polymer Complexation	25	45	25	BI
94905	Production of High Specific Activity Si-32	13	65	55	AE
94906	Molecular Characterization of Flow-Sorted Mammalian Centromeres	38	42	38	EI
94908	The Characterization of Atmospheric Aerosols: Applications to Heterogeneous Gas-Particle Reactions	48	52	48	BC
94909	Computational Modeling of Materials Processing and Processes	25	43	25	AE
94910	Kinetic Studies of Competitive Adsorption Processes Related to Automobile Catalytic Converters	27	27	27	DE
94911	Numerical Simulations of Disordered Superconductors	25	56	44	AE
94912	Applications Of Optical Trapping To Single Molecule DNA Sequencing	38	58	38	EI
94913	Transactional Memories: A New Abstraction for Parallel Programming	55	74	50	AE
94914	Subsurface Noble Gas Transport at the Nevada Test Site	27	33	27	AB
94915	Microbial Dissolution of Iron from Iron Bearing Minerals	28	37	28	DE
94916	The Solution Structure of the cAMP-dependent Protein Kinase	25	47	25	EI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
94917	Development Of Biosensors Based On Spectroscopic Monitoring of Enzymes And Other Proteins	40	57	40	EH
95004	A Comprehensive Monitoring System for Damage Identification and Location in Large Structural and Mechanical Systems		247	188	HI
95013	Combinatorics, Geometry, and Mathematical Physics		100	75	AE
95019	Solution Adaptive Methods for Low Speed Flows and All Speed Flows		200	150	EF
95030	Time Reversal Tests in Polarized Neutron Reactions		110	124	E
95032	Delta-f and Hydrodynamic Methods for Semiconductor Transport		175	131	EH
95050	Calculation of Satellite Line Structures in Highly Stripped Plasmas		99	75	BE
95053	Structure And Thermodynamics Of Surface Recognition		219	165	BH
95058	Decay of Surface Nanostructures via Long-Time-Scale Dynamics		169	128	AE
95068	The Fundamental Role of Solitons in Nonlinear Partial Differential Equations		124	94	AE
95070	Geometry In The Large And Hyperbolic Chaos		99	73	AE
95073	Dynamics of Quantum Wave Packets		200	149	CE
95078	Optimization and Monitoring of Hollow-Fiber Bioreactors		245	215	BI
95086	Sum-Frequency Generation Studies of Membrane Transport Phenomena		225	168	BI
95091	Determining the Role of the Telomere on the Severity of Birth Defects		210	156	EI
95101	Molecular-Level Assemblies on Metal Oxide Surfaces		10		ABE
95113	New Fullerene-Based Mixed Materials: Synthesis and Characterization		295	213	BH
95116	Asymmetric Catalysis in Organic Synthesis		215	160	BD
95121	Optical Imaging Through Turbid Media Using A Degenerate Four Wave Mixing Correlation Time Gate.		280	209	CE
95122	Femtosecond Scanning Tunneling Microscope		275	205	AE
95145	Determination and Study of Cosmic-Ray Composition above 100 TeV		25	19	CE
95146	A Continuous Watch of the Northern Sky above 40 TeV with the CYGNUS Array		11	19	CE
95149	Exploring And Testing The Standard Model And Beyond		683	276	E
95153	Thermodynamic and Electrodynamic Studies of Unusual Narrow-Gap Semiconductors		250	187	BE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95159	New Deposition Processes for the Growth of Oxide and Nitride Thin Films		170	93	EH
95163	The Development of Fullerene Based Hydrogen Storage Systems		250	187	DE
95166	Characterization and Manipulation of Broken Symmetry Materials at Phase Boundaries		120	93	AE
95174	Dispersive Internal Long Wave Models		124	94	DE
95187	A Compact Compton Backscatter X-Ray Source for Mammography and Coronary Angiography		195	145	EI
95194	High-Power, High-Frequency, Annular-Beam Free-Electron Maser		230	180	EH
95198	High Impedance Plasma Opening Switches		90		BE
95206	Minerals Of The Earth's Deep Interior		59	43	AE
95207	Heterogeneous Processing of Bromine Compounds by Atmospheric Aerosols: Relation to the Ozone Budget		77	58	CE
95208	Deriving The Structure Of Pre-Supernovae And Delta Scuti Stars Using Nonradial Oscillations		62	47	AE
95211	Materials Analysis Of Deposits Made By The Directed Light Fabrication (Dlf) Process		100		AE
95212	Telemetric Heat Stress Monitor (THSM) Spin-offs		100		CH
95213	Bartas Iris Biometrics		100		CEI
95214	Measurement of Photodynamic Therapy Drug Concentrations in a Tissue Phantom		100		EI
95215	Ultrasensitive Ultrasonic Transducer Studies		100		EH
95220	Nucleation and Condensation Science		100		AE
95221	Virtual Reality and Telepresence Control of Robots Used in Hazardous Environments		50		BE
95223	Developing the R&D100 Winning "Lattice Boltzmann Permeameter" Towards a Marketable Product		100		EF
95225	Self Assembled Thin Film Chemical Sensors		100		BEH
95226	Determination of the Nuclear Induced Electrical Conductivity of He-3 for Magnetohydrodynamic Energy Conversion		80		DE
95227	Novel Thin Film Electrocatalytic Sensors		25		EH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95228	Chemical Vapor Deposition of Complex Oxides: Materials and Process Development		200		BE
95229	Surface Polymerization Agents		50		BEI
95230	Temperatures and Vibrational Frequencies of Liquid N2/O2 and CO/O2 Mixtures Shock Compressed to 100 kbar and 2000 K		10	65	AE
95231	New Catalytic Processes for the Production of Specialty Polyolefins		20		BI
95232	A Feasibility Study of Beam-Chopping at Low Energy for LANSCE		120		AE
95233	Monte Carlo Code for Neutron Scattering Instrument Design and Analysis		60		AE
95234	Remote Sensing Science - New Concepts and Applications		187		CH
95235	Design of a Neutrino Oscillation Experiment		80		E
95236	Next-Generation Magnetic Nozzle Prototype		80		EH
95237	A Gated, Integrating, Cathode-Pad Readout Chamber		90		EH
95238	Ultrasensitive Nucleic Acid Sequence Detection By Single-Molecule		120		EI
95239	Gravity Gradiometry based on High-Tc Superconducting Sensors		50		EH
95240	The Detectability of Asteroids and Comets Before Earth Impact		20		EI
95404	Cost-Effective Development of Thin Films for Flat-panel Displays		360	13	EH
95412	Prototype Demonstration of Radiation Therapy Planning Code System		108		EI
95414	In Situ Microwave-Energy Based Soil Remediation		260		BE
95415	Waste Minimization In Chrome Plating		259		BE
95422	Hydrogen Fueling Station Development and Demonstration		133		EF
95425	Catalysis for Alternative Feedstocks		342	249	DF
95427	Advancing the Technology Base for High Temperature Membranes		288	199	BI
95428	Process Simulation, Control, and Optimization for Industrial Energy Efficiency		667	400	ABD
95429	Visualization Capability for Non-proliferation and Emergency Training: A "Poor Man's Virtual Reality" System		225	100	AC
95432	Russian Collaborations on Lasers and Advanced Optics		225		CE
95433	Advanced Technology For Nitrogen Oxide (NOx) Abatement In Flue Gas Using Microwave Irradiation Of Coal Char		373		DF

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95434	Global Nuclear Material Flow Model		450	245	AC
95436	Nonproliferation/Counter-Proliferation Synthetic Wargaming Environment		450	11	AC
95439	A Systems Framework for Defining Nonproliferation Program Technology Requirements		225		CH
95442	Measurement Criteria Analysis for Krypton, Xenon, and Hydrogen (H/D/T) Isotopes and Concentration Variability at Distance.		180	123	CGI
95445	Electronic Diamond: Fab Processes and Electron Emission Performance		270		EH
95446	Development of a High Gradient Magnetic Separator Using High Temperature Superconductors		178		AB
95448	Directed Light Fabrication--A Laser Metal Deposition Process for Fabrication of Near Net Shape Components		405	149	AB
95450	Radionuclide Separations Using Pillared Layered Materials		288	259	AB
95451	Disposition of Weapons Plutonium as Non-Fertile Fuel for Light-Water Reactors		225	190	ABC
95453	Decontamination of Radioactive Liquids by Freeze Concentration and Fractional Precipitation		162	135	AB
95455	An Ultra Cold Neutron Facility At LANSCE		88	230	AE
95456	Artificially-Structured Electronic and Biomimetic Materials by Molecular Self-Assembly		180		BE
95458	Giant Magnetoresistance Materials for Magnetic Recording Technology		86	149	CE
95459	Development of High Magnetic Fields for Energy Research		265	299	AE
95460	Applications for Materials Modeling		416		AD
95462	Cancer Risk Assessment		272	281	EI
95466	Night Vision Device Technology Development		90	50	H
95467	The Application of Microrobotics in Warfare		89		BH
95469	Microcellular Ceramic Foams for Radar Absorbing Structures		104		AH
95470	Electromagnetic Targeting of Guns		155		H
95471	Remote Moving Target Indication Assessment		124		H
95472	Autonomous Biomorphic Robots as Platforms for Sensors		88		CH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95473	Development of Structural Materials Exhibiting Dielectric and Magnetic Loss at Radio Frequencies		90		H
95474	Active Vibration Control of Civil Structures		75		EH
95475	Contamination and Uniformity Control in Plasma Processing Tools		213		EI
95476	Technical Evaluation of Russian Aircraft Stealth Coating and Structural Materials		90		EH
95478	Safe Extension of Red Blood Cell Storage Life At 4 C		400		EH
95480	Development of a High Count-Rate Neutron Detector with Position Sensitivity and High Efficiency		90		CG
95481	Human Brain Mapping: Experimental and Computational Approaches		260	225	AI
95483	Chelating Water-Soluble Polymers for Waste Minimization		270		AB
95484	Performance Monitoring for Plume Remediation and Containmeht Actions		270		BC
95485	Neutral Stream Processing of Semiconductor Materials		270		BE
95488	Plasma Source Ion Implantation For Advanced Manufacturing		347	231	DH
95489	Establishing the Operational Durability of Polymer Light-Emitting Diodes		315	149	EH
95491	Deformable Human Body Model Development		143	110	HI
95493	Advanced Ignition of Jet Turbine Engines		271	199	H
95495	Development of High Temperature Superconducting Thick Films		150		AE
95496	High Temperature Superconducting Thin Film Based Electronic Devices		150		EH
95497	Structura versus Properties in High Temperature Superconductors		200		AE
95498	Neutron Scattering and Nuclear Magnetic Resonance Spectroscopy Structural Studies of Protein-DNA Complexes		250		EI
95499	Ion Flooding to Precharge Insulating Materials		150		AE
95500	Detection Of Underground Structures And Tunnels		50		CH
95501	Feasibility of Microwave Interferometry and Fourier Transform Spectrometry for High-Spectral-Resolution Sensing		150		CEI
95601	Generation and Compression of a Target Plasma for Magnetized Target Fusion		260	163	AE
95602	Competency Development in Antibody Production for Cancer Cell Biology		279	265	EI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95608	Geometrically-Compatible 3-D Monte Carlo and Discrete-Ordinates Methods		165	124	AEG
95611	Advanced Three Dimensional Eulerian Hydrodynamic Algorithm Development		285	199	AEG
95621	Foreign Nuclear Test Radiochemical Diagnostics		109	81	AC
95623	Structure, Dynamics, and Function of Biomolecules		320	280	EI
95626	Advanced NMR Technology for Bioscience and Biotechnology		268	200	EI
95632	Prediction and Characterization of Complex Systems		249		AE
95633	Simulation Methods for Advanced Scientific Computing		149	184	AE
95634	Nonlinear Analysis of Biological Sequences		209	185	EI
95635	Diffusive Transport in Modern Polymeric Materials		174		AE
95636	Ultra-Sensitive Sensors for Weak Electromagnetic Fields using HiTc SQUIDS for Biomagnetism, NDE and Corrosion Currents		221	198	CH
95639	Advanced Modeling Of High Intensity Accelerators		206	162	AE
95640	Development of the First Nonhydrostatic, Nested-Grid, Grid-Point Global Atmospheric Modeling System on Massively Parallel Machines		135	99	CE
95643	Laser-Sheet Imaging of HE-Driven Interfaces		263	230	AH
95644	A Neural Network Based System For Damage Identification And Location In Structural And Mechanical Systems		89	68	AI
95651	Binding Carbon Dioxide in Mineral Form: A Critical Step Towards a Zero-Emission Coal Power Plant		179	135	DF
95652	Development of Inexpensive Continuous Emission Monitors for Feedback Control of Combustion Devices that Minimize Greenhouse Gases, Toxic Emissions, and Ozone Damaging Products		40	40	DF
95662	Development of Ion Beam Techniques for the Study of Special Nuclear Materials Related Problems		449	380	ABC
95663	Polymers for Nuclear Materials Processing		100		AB
95665	Structural and Magnetic Characterization of Actinide Materials		270	203	AE
95669	Characterization of Bioactive Materials Using Neutron Reflectivity and Atomic Force Microscopy		125	184	EI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
95675	Science and Technology of Reduced-Dimensional Magnetic Materials		100	79	EH
95676	Bulk Amorphous Materials		295	185	EI
95677	Similarity Landscapes: An Improved Method For Scientific Visualization Of Information From Protein And DNA Database Searches.		49	49	EI
95678	Short-Pulsed, Electric-Discharge Degradation of Toxic and Sludge Wastes		45	47	BE
95680	High-Performance Computations of Electron Microstructures		40	40	AE
95681	Investigations of Biomimetic Light Energy Harvesting Pigments		40	40	DE
95688	Covariation of Mutations: A Computational Approach for Determination of Function and Structure from Sequence		30	30	EI
95696	Development Of An Integrated System For Estimating Human Error Probabilities		178	177	AE
95701	Development of an Automated Core Model for Nuclear Reactors		158	119	AG
95709	Radiation Hardness Measurements of New Permanent Magnet Materials for High-Intensity Linac Applications		54	41	AE
96003	Optical Wavepackets (Optical Bullets): A New Diffraction Free Form of Light Travel			139	CH
96006	Nonlinear Atom Optics			105	BE
96008	Transient Quantum Mechanical Processes			150	EI
96013	Theoretical Studies of Allosteric Changes and DNA Binding of a cAMP Dependent Transcription Activation Protein.			143	EI
96017	Engineering The Specificity Of xylR, A Bacterial Protein That Detects Chemicals In The Environment			258	BE
96025	Numerical Simulations of Biochemical Self-Organization: Calcium Wave Propagation and Microtubel Growth			150	EI
96030	Identification and Characterization of A Human DNA Double-Strand Break Repair Complex			233	EI
96032	Protein Motions that Determine the Efficiency of Photosynthesis			155	DE
96054	Solvation and Ionic Transport in Polymer Electrolyte Membranes			199	BEI
96060	Modification of Heterogeneous Chemistry by Realistic Substrate Complexity			100	BEI

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96068	Uses of Novel Selenium-Containing Chiral Derivatizing Agents: Potential Catalysis for the Chiral Oxidation of Simple Alkenes, and Chiral Promoted Aldol Reactions			214	EI
96082	Heterogenization Of Homogeneous Catalysts: The Effect Of The Support.			289	BEI
96088	Reactivity at Metal Centers Bound to Water-Soluble Catalysts			214	BEI
96109	Material Processing For Self-Assembling Machine Systems			180	EH
96114	Quantum Cryptography For Secure Communications To Low-Earth Orbit Satellites			245	CH
96115	High Average Power Intense-Ion Beam for Materials Modification and Other Applications			246	HI
96142	High Velocity Neutron Stars			50	AE
96146	Micro/Macroscale Coupling in Magnetospheric Plasmas			20	EH
96147	Coronal Mass Ejections in the Solar Wind			60	EH
96148	Striation-Image Monitoring Of Plasmaspheric, L-Resolved Electrodynamics (SIMPLE)			60	CE
96149	Numerical Simulations of Convection Experiments and the Earth's Interior			78	AE
96156	Low Energy Neutral Atom Imager			77	CE
96163	Cosmology With Massive Neutrinos			138	E
96164	Close Encounters of Asteroids and Comets to Planets			59	HI
96166	Modeling Core Collapse Supernovae in Three Dimensions			24	AE
96167	Regge Geometrodynamics in Support of Gravity Wave Astronomy			114	E
96169	Theoretical Research on Dwarf and Classical Novae			20	AE
96180	Sedimentary Basin Response to Strong Motion in Populous Regions			93	BE
96197	Fundamentals Of Laser Ablation In The Analysis Of Geological Materials			124	AE
96213	Magnetic Resonance Force Microscope Development			265	BE
96215	All-Solid-State Four-Color Laser			208	EH
96232	Innovative Composites Through Reinforcement Morphology Design—A Bone-Shaped-Short-Fiber Composite			189	AH
96233	Theoretical and Experimental Investigation on the Low Temperature Properties of the NbCr2 Laves Phase			327	AE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96236	Interfacial Charge Transport in Organic Electronic Materials: The Key to a New Electronics Technology			299	EH
96257	Development of a Fundamental Understanding of Chemical Bonding and Electronic Structure in Spinel Compounds			319	AE
96274	A Molecular Architectural Approach to Novel Electro-Optical Materials			319	EH
96286	A Self Consistent Multiscale Theory Of Internal Wave, Mean Flow Interactions In The Ocean			80	AE
96287	Particles and Patterns in Cellular Automata			105	EH
96305	Designing A Micro-Mechanical Transistor			63	EH
96310	Elliptic Solvers for Adaptive Mesh Refinement Grids			220	AEG
96326	Fiber Optic Communications Using Solitons (FOCUS)			60	CH
96327	High-Quality Finite-Difference Schemes for Partial Differential Equations and Discrete Vector and Tensor Analysis			115	AEG
96334	Neutron Measurements to Optimize Treatment of Cancer Patients with Fast Neutrons			100	EI
96339	Neutrino Physics at Fermilab			271	E
96343	Neutrinos and Theory of Weak Interactions			342	E
96346	Chiral Symmetry in Finite Nuclei			100	E
96349	Solar Neutrino Physics			500	E
96351	Weak Interaction Measurements With Optically Trapped Radioactive Atoms			249	AE
96367	Determination of Optical-Field Ionization Dynamics in Plasmas through Direct Measurement of the Optical Phase Change			197	EH
96385	High-Intensity Laser-Matter Interaction Physics			89	AE
96388	A Target Plasma Experiment for Magnetized Target Fusion			266	AE
96391	Equation of State of Dense Plasmas			260	AE
96410	Inorganic-Organic Composite Nanoengineered Films Using Self-Assembled Monolayers for Directed Zeolite Film Growth			99	BE
96411	Advanced Polymer Chemistry of Organometallic Anions			99	BE
96412	Experimental Validation of Superconducting Quantum Interference Device Sensors for Electromagnetic Scattering in Geologic Structures			70	CE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96413	Simulating the Decays of Bottom and Charm Mesons			90	E
96414	Super-Speed Computer Interfaces and Networks			75	ACH
96415	Studying Properties of Cell Suspensions With Elastic-Scattering			74	E
96416	Cyclodextrin-Based Chemical Microsensors for Volatile Organic Compounds (VOCs)			74	BHI
96417	Acoustic Resonance Spectroscopy			75	EH
96418	Reaction Kinetics Relevant to the Recycle Hydride-Dehydride Process for Plutonium Recovery			75	ABC
96419	Fundamental Studies of Polymer Filtration			74	BI
96420	Texture Characterization for Primary Design			158	AE
96421	Emerging Pathogens: Dynamics, Mutation and Drug Resistance			100	EI
96422	Electromagnetic Inverse Applications for Functional Brain Imaging			25	CE
96423	Gene Shuffling Using Flow Cytometry			150	EI
96424	Ultrafast Laser Studies of Solution Reactivity			100	BE
96425	Optical Measurement of Drug Concentrations in Tissue			100	EI
96426	High Sensitivity Solid State Carbon Monoxide Sensor Development			50	EF
96427	Biotechnology Approaches to Stable Isotope Labeling for Biomolecular Structure/Function Studies			60	EI
96428	Neutron Structural Biology			65	EI
96429	Nonlinear Processes in Earthquakes			70	CE
96430	Fluxes of Water and Energy in Physically Heterogeneous Environments			120	BEI
96431	Global Climate Effects of the Emerging Chinese Transportation System			70	DF
96432	Isotopic Prediction of Eruption Volume at Continental Volcanoes			65	EI
96433	Catalysts for Hydrocarbon Oxidation			250	BF
96434	Liquid Metal Focused Ion Beam Etch Sensitization and Related Data Transmission Processes			192	EI
96501	Detection And Characterization Of Of Biological Weapons Agents By Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry			114	CH
96504	Universal Biological Agent Point Sensor Program Development			113	CH
96505	Sensors for Point Detection of Chemical and Biological Warfare Agents			114	CH

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96507	Detection of Underground Structures and Tunnels			255	CH
96508	Neutron-Based Land Mine Detection System Development			150	EH
96510	Ceramic/Polymer Functionally Graded Material (FGM) Lightweight Armor System			199	EH
96523	Removal of Tranuranic (TRU) Materials from Contaminated Equipment Using Plasma Decontamination			197	AB
96524	Improved Atmospheric Transport for Risk Assessment In Complex Terrain			173	ACH
96529	Advanced Oxidation Technologies for Chemical Demilitarization			219	BC
96531	Integration of Advanced Nuclear Materials Separations Processes			250	ABC
96532	In Situ Bioremediation of TCE-Contaminated Groundwater			197	BI
96534	Sub-Surface, Directed Energy Methods for Groundwater Treatment			169	BH
96537	Environmentally Conscious Coal Combustion: Development Of Process Monitors And Improved Numerical Models			48	EF
96538	Modeling and Assessment of Concrete and the Energy Infrastructure			108	DE
96539	A New Model to Estimate Regional Emissions Inventories			200	EF
96542	Active Noise and Vibration Control for Vehicular Applications			150	EI
96543	Microwave Processing Improvements For Methane Conversion To Ethylene			260	EF
96544	Reservoir Enhancement On the Impermeable Margins of Productive Geothermal Fields: Integrated Resource Development and Management			48	DE
96547	The Carpinteria Reservoir Re-Development Project			98	EF
96548	Characterizing Mechanical Effects of Aging Damage			200	AE
96550	Separation Science and Technology (part I): Membrane-Based Separations and Destruction Processes			699	ABC
96551	Integrated Approach to Advanced Machining			200	AB
96556	Modeling for Environmentally-Conscious Manufacturing			75	AB
96559	Novel Gene Complex Structure Determination by Neutron and X-ray Scattering			170	EI
96560	Frequency-Resolved Optical Gating: A Diagnostic for the Characterization of Optoelectronic Materials and Devices			109	EH
96561	Supporting Technologies for a Long Pulse Spallation Source			1050	AE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96571	Measurement of Fissile Material in Spent Fuel and Alternate Nuclear Materials			95	ABC
96573	Information Handling/Data Fusion Technologies To Extract And Analyze Export Information			50	CH
96575	Global Nuclear Material Monitoring			305	AC
96576	Satellite - Based Laser Windsounder			225	BCH
96581	Rapid Prototyping of Hazardous Materials Using the Directed light Fabrication Process			164	AB
96582	He-3 Targets for Tritium Production in Fission Systems			150	AG
96583	Fundamental and Applied Studies of Helium Ingrowth in Plutonium			410	A
96585	High-Magnetic-Field Research Collaborations			250	AE
96586	Secure Communications			100	CH
96587	Distributed TeleMedicine for the National Information Infrastructure Testbed			100	EI
96588	Explosives Detector Using the Optical Signature of Deflagrating Explosive Particulate			75	CH
96589	New Anion Exchange Polymers for Improved Separations in Nuclear and Industrial Applications			50	BG
96590	National Environmental/Economic Infrastructure System Model			75	CE
96591	Alternative Target Technologies for LWR Production of Tritium			150	AG
96592	Interpretations of Experiments			95	AI
96600	Neutron Scattering from Correlated-Electron Systems			300	EH
96602	Microstructures of Transition Metal Oxides Characterized by Neutron and X-Ray Scattering			92	AE
96603	Complementary Neutron Diffraction And Computational Micromechanics Studies Of Polycrystalline Deformation In Advanced Materials			291	AH
96604	Neutron Scattering Studies on Shear-Induced Structure in Polymers			142	AE
96605	Dynamics of Polymers at Interfaces			92	AE
96607	Actinide Crystal Structures with an Emphasis of Plutonium Alloys			235	AE
96611	Self-Organization and Pattern Formation			234	BE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96612	Landscapes and Dynamics of Proteins			235	EI
96613	Applications of Nonlinear and Stochastic Dynamics			280	AE
96614	Many-Body Theory Program			170	AE
96615	New Initiatives in Materials Characterization, Modeling and Synthesis			300	AE
96616	Texture Focus Competency Development Proposal			225	AE
96620	Indigenous Bacteria as Hosts for Proteins for Bioremediation			424	BE
96621	Engineering Haloalkane Dehalogenase for Bioremediation			524	BE
96622	Remote Sensing Science Thrust: Technical Component (1) Hyperspectral Sensing			250	BC
96623	Remote Sensing Science Thrust: Technical Component (2) Laser Remote Sensing			300	BC
96624	Remote Sensing Science Thrust: Technical Component (3) New Concepts			300	BC
96625	Chemistry and Microstructure of High Temperature Superconductor			250	AE
96626	Pinning Vortices and Enhancing High Temperature Superconductor Critical Currents			175	AE
96627	Role of Charge Localization in the Basic High Temperature Superconductivity Mechanism			319	AE
96628	Theory and Modeling of Correlated Electron Materials			312	EH
96629	Synthesis and Characterization of Correlated Electron Materials			413	EH
96630	Adaptive Monte Carlo Methods for Radiation Transport			308	AE
96631	Density Function Estimation for Monte Carlo Simulations			138	AE
96632	Novel Monte Carlo Algorithms for Statistical Mechanics			167	AE
96633	Theoretical Foundation for Adaptive Monte Carlo			235	AE
96634	Molten Salt and Molten Lead Systems Studies			700	ABC
96635	Molten Salt and Separations Technologies Evaluation			750	ABC
96636	Understanding and Controlling Self-Assembly			339	EH
96637	Tailoring the Interfacial Electronic Structure of Organic Electronic Materials and Devices			279	EH
96638	Controlling Function of Polar Organic Multilayers			279	BE
96639	Neutron Metrology for Stockpile Stewardship at LANSCE			325	AE

ID	Project Title	FY94 $K	FY95 $K	FY96 $K	Few Program Areas Most Significantly Supported
96640	Advanced Techniques for Producing, Polarizing, and Storing Ultra-Cold Neutrons			400	AE
96641	Advanced Research Capabilities for Neutron Science and Technology - Neutron Polarizers			200	AE
96642	Dynamic High-Strain Deformation of Materials: Experiments, Advanced Constitutive Modeling, and Computational Implementation			750	AH
96643	Distortion, Residual Stress, and Thermal Gradient Issues for Plutonium Gravity Casting in Ambient Temperature Molds			350	A
96644	Nuclear Futures Analysis and Scenario Building			375	ACG
96645	Advanced Computational Science			250	AEI
96650	Advanced Measurements and Techniques in High Magnetic Fields			135	AE
96651	High-Energy Test of Proton Radiography Concepts			385	AC
96652	Zircon as a Host Phase for Plutonium Disposition			100	A
96653	Structural Biology of Disease Associated DNA Repeats and Protein-DNA Complexes Involved in the Repair of DNA Damage			250	EI
96654	The Biology of Novel Animal Genes: Mouse APEX Gene Knockout			55	EI
	Totals	63533	60832	54269	

Oak Ridge National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Oak Ridge National Laboratory
LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
Advanced materials synthesis, characterization, and processing					
OR9200	3211-0697	Fundamental Studies of Fullerenes and Related Materials	400	0	0
OR9200	3211-0699	Electron Holography for High Resolution Electron Microscopy and Other Coherent Beam Imaging Techniques	260	0	0
OR9300	3210-0464	Densification and Microstructure of Brittle Materials	70	0	0
OR9300	3210-0466	Atomic Layer-by-Layer Construction of New Superconducting Oxides	94	0	0
OR9301	3210-0473	Doped Dislocations for Atomic-Scale Electron Devices	45	0	0
OR9301	3211-0718	Melting	240	265	0
OR9303	3210-0481	Enhanced Microwave and RF Sintering of Ceramic Materials	4	0	0
OR9303	3210-0485	Enhanced Diamond Film Growth by Increased Atomic Hydrogen Concentration	40	0	0
OR9304	3210-0488	Development of High Numerical Aperture Optical Fibers	25	0	0
OR9305	3211-0745	Damage-Tolerant Oxide Scales	20	0	0
OR9305	3210-0489	Growth of Large Area Single Crystal Cubic Boron Nitride and Diamond Layers.	61	0	0
OR9400	3210-0495	Alloy Design of Nd2Fe14B Permanent Magnets	90	30	0
OR9400	3210-0496	In Situ Scanning Probe Microscopy of Actively Corroding Surfaces	30	66	0
OR9400	3210-0498	Chemical Vapor Deposition of Thermal Barrier Coatings	70	22	0
OR9400	3210-0500	Development of a Method of Forming Dislocation-Free SOI by Oxygen Implantation	110	0	0
OR9400	3210-0503	Deformation Processing of Metal-Matrix Composites to Obtain Controlled Alignment of the Reinforcement	10	0	0
OR9401	3211-0750	Interaction of Lasers with Polymers	40	63	45
OR9401	3211-0758	Thin Film Perovskites - Ferroelectric Materials for Integrated Optics	230	250	296
OR9402	3211-0747	Quantum Size Effects in Artificially Structured Semiconductors: Fabrication and Properties of Novel Mesoscopic Structures	236	314	270

Oak Ridge National Laboratory
LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9403	3210-0512	Development of Electrically Active Liquid Materials	15	0	0
OR9403	3210-0517	Life Prediction and Constitutive Model Framework for a Discontinuous Metal Matrix Composite	40	80	0
OR9404	3211-0767	Diagnostics of Amorphic Diamond Film Growth by Pulsed Laser Deposition	12	0	0
OR9405	3210-0524	A New Two-Modulator Ellipsometer for the In-Situ Monitoring of Thin Film Growth	36	94	0
OR9405	3210-0525	New Method for Melting Titanium Aluminide	10	0	0
OR9405	3210-0527	Probing the Origins of Catalytic Activity	10	110	0
OR9405	3210-0528	The Nano-Milling Machine: Laser Smoothing of Semi-Conductor Surfaces	6	6	0
OR9500	3210-0530	Application of Acoustic Resonance Spectroscopy to the Evaluation of Long-Term Mechanical Reliability of Advanced Ceramics	0	85	0
OR9500	3210-0533	Epitaxial Thin-Film Growth of (K,Rb)NbO3 and Rare Earth-Doped GdLiF4 for Electro-Optic and Laser Applications	0	120	0
OR9501	3211-0773	Fabrication and Characterization of Nanoscale Structures Using Advanced Scanning Probe Technology	0	343	390
OR9501	3211-0776	Catalyst Characterizaton and Development	0	348	385
OR9502	3211-0780	Structural and Physical Properties of Ceramics	0	45	0
OR9502	3211-0781	Induced Magnetism and Enlarged Magnetic Anisotropy in Ultrathin Films	0	15	0
OR9503	3210-0548	Study of Vapor Controlled Liquid Alloy Solidification	0	15	0
OR9504	3210-0555	Iron Aluminide Composites	0	30	53
OR9506	3210-0564	Cold-Wall Induction Glass Melter	0	15	0
OR9506	3210-0567	Advanced Deposition Techniques for Producing Thin Films of Polycrystalline Silicon	0	35	85
OR9506	3211-0796	Improving the Quality of SOI Produced by SIMOX	0	23	0

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LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9506	3210-0569	Ferroelectric Oxides for an Si-Integrated Ferroelectric Field Effect Transistor	0	25	105
OR9506	3210-0570	Shape Memory Alloy Reinforcement of Metals	0	15	0
OR9507	3210-0573	Near-Net Shape Fabrication of Oxide Composites	0	10	5
OR9507	3210-0574	Fundamental Mechanisms of Surfactancy in Nucleation and Growth	0	12	113
OR9600	3211-0800	Large Area Development for the Semiconductor Industry	0	0	360
OR9600	3211-0806	Bulk Amorphous Alloys	0	0	360
OR9600	3211-0807	Atomic Scale Investigation of Thermal and Electrical Properties of Grain Boundaries	0	0	315
OR9601	3210-0578	Chemical Vapor Deposition of Carbon Nitride	0	0	100
OR9601	3210-0581	Thin Film Growth of Wide Band Gap Refractory Semiconductors	0	0	50
OR9602	3210-0584	Cluster-Assembled Solids	0	0	50
OR9602	3210-0587	Development of Electrically Active Liquid-Matrix Composites	0	0	75
OR9602	3210-0589	Novel Technique for Producing Low-Cost High-Quality Rapidly Solidified Powders	0	0	70
OR9603	3210-0590	Three-Component Functionally Gradient Material for SiC-Metal Joints	0	0	15
OR9603	3210-0592	Polymer Membranes for Gas Separations Using Ion Beam Technology	0	0	60
OR9603	3210-0595	A Novel Activated Carbon and Desorption Technique for Gas Separation	0	0	15
OR9603	3211-0815	Mesoscale Materials Science Initiative	0	0	210
Biological and environmental sciences and technology					
OR9203	3210-0444	Photodecomposition of Organic Contaminants Separated by Membrane-Assisted Solvent Extraction	15	0	0
OR9300	3210-0463	Identification and Characterization of Ligand Binding Sites of Human EGF Receptor	10	0	0

Oak Ridge National Laboratory
LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9300	3210-0467	A Novel Method for the Detection of Genotoxic Chemical Adducts	55	0	0
OR9300	3210-0468	Salmon Stock Identification Using Laser Microprobe Chemical Analysis	50	0	0
OR9300	3210-0469	Handedness of Biological Molecules: Effects on Interactions with Chiral Electrons and Photons	50	0	0
OR9301	3210-0472	Biological and Biogeochemical Consequences of Increased Ultraviolet Light on Marine Productivity	39	0	0
OR9301	3210-0474	Pore Structure Characterization for Solute Transport Research	20	0	0
OR9302	3211-0721	Molecular Diagnostics for Biotechnology	300	310	0
OR9302	3211-0724	Advanced Concepts for Conversion and Bioprocessing of Plant Materials	300	300	0
OR9302	3211-0725	Advanced Concepts for P.oduction of Plant-Derived Feedstocks	260	260	0
OR9302	3210-0480	One-Step Photconversion of Biomass to Renewable Organic Fuels and Chemicals	80	0	0
OR9303	3210-0484	Catalyzed Reduction of Nitrate in Caustic Solution	30	0	0
OR9303	3210-0486	Scanning Probe Microscopy: High-Resolution Imaging of Biomolecules	71	0	0
OR9400	3210-0497	Design of a Biobleaching Catalyst by Chemical Modification of Xylanase	110	0	0
OR9400	3210-0499	Altered Gene Expression in the Pathogenesis of Mammalian Developmental Abnormalities	5	120	0
OR9400	3210-0501	Application of New Analytical Techniques for Chemical/Molecular Dosimetry Studies of Female-Specific Germ-Cell Mutagens	60	0	0
OR9401	3211-0756	Advanced Integrated Biosensors	278	232	256
OR9402	3211-0746	Advanced Lignin Extraction	250	200	15
OR9402	3210-0504	Electroactive Reporter Groups for Biomolecules	15	0	0
OR9402	3211-0759	Biological Effects of Magnetic Fields: Theoretical Approach to Cancer Promotion	419	293	0
OR9402	3210-0505	Carpet Emissions Toxicity Characterizations	10	0	0

Oak Ridge National Laboratory
LDRD Program Summary
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DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9402	3210-0506	Cryobiological Preservation of Anopheles Embryos	60	39	0
OR9402	3210-0508	Characterization of Lignins by Laser Induced Fluorescence	15	0	0
OR9402	3210-0509	Bathymetric Indicators of Global Change	1	14	0
OR9403	3210-0511	Interactive Capability for Landscape Analysis and Modeling via Internet Linkage	15	0	0
OR9403	3210-0513	Effect of T Cell Immune Response Type on Passage of Retroviral Infection in B10.F Mice	50	30	0
OR9403	3210-0514	Detection System for Unlabeled DNA Micro-Arrays	49	42	0
OR9403	3210-0515	Oscillating Microbar Sensor for Ultrasensitive Detection of Chemical Vapors	75	25	0
OR9403	3210-0516	Fingerprints of Children	50	92	0
OR9404	3211-0762	Neurotoxin Biosensor	40	0	0
OR9404	3211-0763	Origin of Life in Deep Subsurface	25	0	0
OR9404	3211-0764	Drosophilia Cryopreservation: Intracellular and Intraorganismal Vitrification	45	0	0
OR9404	3210-0519	Microstructured Immunosensor	14	0	0
OR9404	3210-0520	The Biochemical Basis of the Decline in Dark Respiration and Nitrogen Concentration in Trees Growing Under Elevated CO2	10	70	0
OR9404	3211-0766	Automated Methods for DNA Preparation	30	0	0
OR9405	3210-0523	Uranium Binding by Bacteria from High-Carbonate, Low-Metal Environments	15	0	0
OR9405	3210-0521	A Rapid Method for Identifying the Scurfy Gene	5	89	0
OR9500	3210-0531	Combined Photochemical and Biological Remediation of Dilute Aqueous Waste	0	110	0
OR9500	3211-0769	Identification of Genes Controlling Critical Aspects of Neurological Development and Function	0	453	394
OR9500	3211-0771	Non-Invasive Genetic Therapy Using Two-Photon Activated Pharmaceuticals	0	379	323
OR9501	3210-0535	Inhibitory Effect of an Amoebae/Bacterial Preparation on Cultured Carcinoma Cells	0	85	0

Oak Ridge National Laboratory
LDRD Program Summary
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DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9501	3210-0539	Nanofabrication of Biomolecular Optoelectronic Components	0	65	65
OR9502	3211-0778	An Environmentally Friendly Method for Recycling Wastepaper	0	50	0
OR9502	3210-0543	A Novel Approach to Destroy Trichloroethylene	0	74	25
OR9503	3210-0545	Nitrate-Dependent Enhancement of Dechlorination of Lindane in a Filamentous Cyanobacterium	0	15	0
OR9503	3210-0549	Biochemical Basis of Uranium Reduction/Precipitation by Micro-organisms	0	38	50
OR9503	3211-0784	Development of DNA-Tagged Microsphere Colloidal Tracers	0	79	0
OR9503	3211-0786	Linking the Global Distribution of Soil Resources with Economic Productivity and Biodiverstiy	0	40	0
OR9503	3210-0550	mRNA Secondary Structure: Features and Their Functional Significance	0	21	79
OR9504	3211-0787	Studies of Adverse Human Response to Indoor Air Using Mouse Bioassay	0	20	0
OR9504	3210-0552	Production of AIDS-Treatment Drugs Based on Microwave-Assisted Chemical Reactions	0	20	69
OR9504	3210-0556	A Novel Method for High Resolution Biomolecule Mass Spectrometry	0	25	73
OR9504	3210-0557	The Role of Ice Surfaces in Atmospheric Photochemistry	0	5	4
OR9505	3211-0792	Scientific Protocols for More Efficient Instrumentation for Generating Mouse Mutants to Study Gene Function	0	31	0
OR9505	3211-0794	Modeling Contaminant Migration Using Remote Sensing Analysis of Aqueous Mixing Processes	0	23	0
OR9505	3211-0795	Functional Analysis of the Tg737 Gene Utilizing the Chick Limb as a Model System	0	13	0
OR9506	3210-0566	Altered Gene Expression and Mammalian Embryonic Development	0	21	99
OR9600	3211-0802	Thorium-229 Recovery and Medical Treatment Application	0	0	398
OR9600	3211-0803	New Photosynthetic Pathways	0	0	400
OR9601	3211-0809	Effect of Cosmic Radiation on DNA	0	0	11

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LDRD Program Summary
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DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9601	3211-0810	User Facility Development for Transgenic and Targeted Mutant Mice	0	0	352
OR9601	3210-0575	Regulation of Gene Replication in Mouse Chromosome 7	0	0	130
OR9601	3210-0576	Role of the Agouti Gene in Cancer	0	0	124
OR9602	3210-0583	Measurement of Oxide-Mineral Reduction Using X-Ray Absorption Spectroscopy	0	0	100
OR9603	3211-0814	A Free-Air Carbon Dioxide Exposure Facility in a Deciduous Forest	0	0	260
Computational science and advanced computing					
OR9300	3210-0471	Applications of the Monodromy Method to Accelerator Dynamics and to Dissipative Systems	21	0	0
OR9302	3211-0720	Analysis of Large Scientific Data Sets	380	450	0
OR9302	3211-0722	Modeling of Plasma-Based Materials Processing	330	336	0
OR9302	3211-0723	Computational Biology	300	285	0
OR9302	3210-0479	Bayesian Methods and Algorithms for Sequencing Human DNA and for Identifying Functional Subsequences	55	0	0
OR9401	3211-0749	Parallel Code for Link-Cell Definitions	60	84	44
OR9401	3211-0751	Molecular-Based Study of Fluids and Amorphous Materials	177	210	185
OR9401	3211-0752	Computational Crystallography	100	125	119
OR9401	3211-0753	Crystallographic Applications of Topology	153	175	166
OR9401	3211-0754	Distributed Computing Over High-Speed Networks	179	195	150
OR9401	3211-0755	Exploring Multi-Media Over ATM and High-Speed Networks	114	119	150
OR9403	3210-0518	Innovation Analytical Tools for Statistical Examination of DNA Sequence Melting Data	6	0	0
OR9405	3210-0522	Numerical Simulation of Sintering	15	77	0
OR9500	3210-0534	Computational Nanotechnology	0	83	57
OR9503	3210-0546	A Computational Model of Sensing, Pathfinding, and Navigation by Axonal Growth Cones	0	15	0
OR9505	3210-0560	Computer-Aided Diagnosis of Mammographic Images	0	53	69

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LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9505	3211-0789	Computational Forensics	0	50	356
OR9505	3211-0790	Human Modeling in Radiation Transport and Dosimetry	0	50	160
OR9505	3210-0562	Development of Advanced Neutronic Methods as a Foundation for a Numerical Research Reactor	0	22	94
OR9506	3210-0563	Parallelization of the Hamburg Ocean Model	0	15	0
OR9506	3211-0791	Computational Neuroscience	0	50	0
OR9507	3211-0798	Development of a New Parallel Algorithm for Explosive Nucleosynthesis	0	12	0
OR9600	3211-0805	The Virtual Laboratory Extended: Neutron Scattering at HFIR	0	0	200
OR9601	3210-0579	Feasibility of Hybrid Radiation Transport Analysis	0	0	58
OR9602	3211-0811	Mining Large Multidimensional Data Bases	0	0	240
OR9604	3211-0816	Remote Electron Microscopy	0	0	57
Energy production and end-use technologies					
OR9301	3211-0719	Extraordinary Approaches to Emission Reduction: Altering Fundamental Gas Phase Processes with Energy Fields and Advanced Diagnostics	450	439	0
OR9402	3210-0507	Advanced Zoned Tokamak with Edge Control	36	0	0
OR9404	3211-0761	Ion Microprobe Study of Corrosion in Steam Generators	60	0	0
OR9404	3211-0765	Real-Time Dynamic Traffic Assignment Model Research	100	100	0
OR9404	3211-0768	Prototype Framework for R&D Decisions	40	0	0
OR9501	3210-0540	A Coal Furnace Flame Model Using the Moving Boundary Formulation	0	17	0
OR9502	3210-0542	Study of Active Working Fluid Enhancement to the Brayton Power Cycle	0	54	18
OR9503	3210-0547	Small Engine Emissions Research	0	15	0
OR9503	3211-0785	Transcritical Cycle for Air Conditioning and Refrigeration	0	40	0
OR9505	3211-0788	Flywheel Containment Concepts	0	75	0
OR9507	3210-0571	Peaked-MMF Reluctance Motor	0	8	6
OR9507	3211-0797	Development of a Closed-Cycle Gas-Turbine Performance Model	0	23	0

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LDRD Program Summary
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DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9601	3210-0577	Small Aspect Ratio Toroidal Hybrid Device	0	0	100
OR9602	3210-0582	A Novel Superconducting Brushless and Slipringless Generator	0	0	70
OR9603	3210-0594	Exhaust Remediation Using Non-Thermal (Plasma) Aftertreatment	0	0	64
Instrumentation, manufacturing, and control technologies					
OR9200	3211-0698	Optical Processing Enhancement of Real-time Advanced Detection (OPERAD)	305	0	0
OR9202	3210-0441	Improved Joint Design for Robotic Manipulators	12	0	0
OR9301	3211-0717	Leapfrogging Inverter Topology for High-Efficiency Motor Drives	384	150	0
OR9302	3211-0726	Design of Innovative Particle Detectors	150	150	0
OR9302	3211-0727	High-Energy Calorimeter Design and Development	218	190	0
OR9304	3210-0487	Evaluation of High Numerical Aperture Optical Test Fibers	15	0	0
OR9305	3210-0490	Wavelets in System Identification for Advanced Manufacturing	55	5	0
OR9305	3210-0491	Innovative Experimental Stress Analysis on Electromechanical Testing Machines by Laser Moire Interferometry	4	0	0
OR9305	3210-0492	A Laser-Based Negative Ion Source: Exploration of a Novel Concept	75	0	0
OR9306	3210-0493	Data Transmission From Rotating Parts Via a Non-contact Method	8	0	0
OR9400	3211-0748	Micro-Dimensional Calibration System	160	226	0
OR9401	3211-0757	Electro-optics for Sensor Applications	36	43	44
OR9402	3210-0502	Chaos Analysis of Electroencephalogram (EEG) Data for Epilepsy Detection	90	41	0
OR9403	3211-0760	Ion Beam Milling Micro-fabrication	200	0	0
OR9403	3210-0510	Hybrid Refractive/Diffractive Diamond-Turned Optics	38	70	0
OR9405	3210-0526	Experimental Applications of Quantum Interference for Concentration Measurements and for Coherent Control of Chemical Reactions	7	88	0

Oak Ridge National Laboratory
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FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9405	3210-0529	Isotope Ratios Using Time-of-Flight Secondary Ion Mass Spectrometry	15	0	0
OR9500	3210-0532	Experimental and Theoretical Investigation of the Role of Nonlinear Dynamics in Plasma Processing	0	95	0
OR9500	3211-0770	A New High Performance Secondary Ion Microprobe for Light Stable Isotope Ratio Studies in Environmental, Materials, and Earth Sciences	0	372	386
OR9500	3211-0772	Miniature Instrumentation for Medical Diagnostics	0	399	335
OR9501	3211-0775	Coherent Infrared Imaging Camera (CIRIC)	0	399	395
OR9501	3211-0777	Advanced Digital Processing for Electron Microscopy	0	40	0
OR9501	3210-0537	Plasma Edge Instability-Materials Processing Implications	0	50	10
OR9502	3210-0541	Machining of Asphere Surface on Phosphate Glass	0	14	0
OR9502	3211-0779	A Framework for Instruments on a Chip	0	75	0
OR9503	3211-0783	Harsh Environment Test Bed	0	150	0
OR9504	3210-0551	Plasma Source Multicharged-Ion Implantation	0	50	70
OR9504	3210-0553	Method for Detecting Large Strains in Rotating Components	0	63	0
OR9504	3210-0554	Optical Fiber Sensors Embedded in Metal Components	0	11	4
OR9504	3210-0558	Laser-Based Negative Ion Mass Spectrometry for Enhanced Sensitivity and Structural Information	0	40	54
OR9504	3210-0559	Development of a Practical, High Accuracy, Phosphor-Based Thermometer	0	45	67
OR9505	3210-0561	Ultrasonic Sintering of Inorganic (Metal and Ceramic) Powders	0	15	0
OR9505	3211-0793	Hydraulically Powered Man-Amplifier System	0	50	0
OR9506	3210-0565	Generation of Tunable, Picosecond Infrared Laser Pulses by Nonlinear Optical Techniques	0	14	0
OR9506	3210-0568	Charge Concentration for High Sensitivity/High Specificity Detection of Targeted Biopolymers	0	30	47

Oak Ridge National Laboratory
LDRD Program Summary
FY 1994-1996

DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9507	3210-0572	Sputter Initiated Resonance Ionization Spectroscopy of DNA	0	15	0
OR9601	3211-0808	Optical Application Specific Integrated Circuits (OASICs)	0	0	350
OR9601	3210-0580	Two-Phase, Mini-Channel and Micro-Channel Cooling Technology	0	0	100
OR9602	3211-0812	Intelligent Wireless Sensors and Systems	0	0	145
OR9603	3211-0813	Exploiting Nonlinear Sensitivity to Control Spatio-Temperal Chaos	0	0	55
OR9603	3210-0591	Restriction Mapping of DNA by Direct AFM Imaging	0	0	14
OR9603	3210-0593	An Infrared Spectroscopy-Based Sensor for Automotive Fluid Composition Monitoring	0	0	45
Neutron-based science and technology					
OR9200	3211-0696	National Resource Instrumentation for Structural Biology and Solid State Physics	450	0	0
OR9501	3211-0774	Design of an ANS-Based Experiment to Search for Baryon Non-Conservation in Neutron-Antineutron Transitions	0	260	0
OR9501	3210-0536	Neutron Beam Filter Optimization Studies for Boron Neutron Capture Therapy	0	60	65
OR9502	3210-0538	Neutron Scattering Characterization of Polymerization Mechanisms in Environmentally Responsible Carbon Dioxide	0	99	19
OR9502	3211-0782	Experiments in Positron Spectrometry	0	30	0
OR9502	3210-0544	Iridium Determination in Ancient Bone	0	25	25
OR9600	3211-0799	Design of an Experiment to Search for Baryon Non-Conservation in Neutron-Antineutron Transitions	0	0	300
OR9600	3211-0804	Center for In Situ Neutron-Based Characterization of Materials and Energy Conversion Components	0	0	360
OR9602	3210-0586	Development of Californium-252 Neutron Sources for Tumor Brachytherapy	0	0	92
OR9602	3210-0588	Structure of Aqueous Electrolyte Solutions by Neutron Scattering at High Temperatures and Pressures	0	0	100

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LDRD Program Summary
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DOE Number	ORNL Account Number	Title	Budget ($k) FY94	FY95	FY96
OR9604	3211-0817	Expanded Neutron Science Opportunities with the ORELA Facility	0	0	45
Laboratory Foundations					
OR9600	3211-0801	National Radioactive Ion Beam Facility Feasibility Study	0	0	360
Total ORNL LDRD Program			9,923	12,656	12,499

Pacific Northwest National Laboratory

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: This is one consolidated listing covering the three fiscal years.

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Atmospheric Sciences					
PN94003	893	A Multidisciplinary Investigation of Heterogeneous Atmospheric Processes	236.9	302.0	250.0
PN93089	807	Advances in Desktop Atmospheric Dispersion Modeling	46.1	25.9	
PN95008	984	Beyond Reduced Form Climate Model		10.9	
PN93100	818	Global Atmospheric Chemistry		23.3	
PN93126	844	Graphical Interface for Ocean Global Circulation Models	10.9		
		Subtotal	**293.9**	**362.1**	**250.0**
Biotechnology					
PN95001	977	750 MHz NMR Determination of the 3D Structure of a Unique Reductive Dehalogenase		96.4	100.0
PN93086	804	Advanced Biomedical Science and Modeling	113.6	119.7	
PN95020	996	Degradation of Explosives by the Combination of Enzymatic and Microbial Processes		19.7	15.0
PN96XXX	TBD	Development of Enzymatic Bioprocesses Based on Redox Enzymes			50.0
PN94025	915	Dynamics, Modeling and Redesign of Microbial Proteins	126.5	228.8	50.0
PN96XXX	TBD	Electron Paramagnetic Resonance Spectroscopy of Environmental Enzymes			87.0
PN94030	920	Enzymology of Bacterial Metal Reductase and Dehalogenase	149.1	94.5	25.0
PN96XXX	TBD	Ethical, Legal, and Social Issues Surrounding Microbial Biotechnologies for Environmental			30.0
PN94034	924	Functional Characterization of Bacterial Plasmids	60.9	110.3	25.0
PN96XXX	TBD	Glutathione Transferase Molecular Dynamic Simulation			58.0
PN95043	1019	Identification, Purification and Characterization of the Reductive Dehalogenase of Desulfomonile		166.0	25.0
PN95056	1032	Microbial Gene Expression and Genetic Engineering		83.1	75.0
PN94050	940	Microbial Genomics	251.0	210.0	200.0
PN95057	1033	Microbial Informatics		70.5	75.0
PN96XXX	TBD	Near-Field Optical Microscopy of Dehalogenase Electron Transport			54.0
PN94061	951	NMR Studies of DNA Structure Associated With Chemical Adduction	68.9	67.2	62.0
PN96XXX	TBD	Phylogenetic Analysis of Anaerobic Dechlorinators			70.0
PN93155	873	Protein Structure Analysis	10.2		
PN93166	884	Structural Studies of Modified Histone Species	100.9	53.0	
PN95089	1065	Vegetable Oil-Chlorinated Solvents		11.1	
PN95090	1066	Vegetable Oil-Pilot Scale Test Transport Analysis		9.3	50.0
		Subtotal	**881.1**	**1339.6**	**1051.0**

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Chemical Instrumentation and Analysis					
PN96XXX	TBD	A Flow Injection/Electrochemical System for Detection of DNA Damage			80.0
PN92004	722	Advanced Separations and Mass Spectrometry	210.3		
PN95006	982	Application of Mass Spectrometry to Life Science and Bioremediation Research		100.8	172.0
PN96XXX	TBD	Classification of Microorganisms by Rapid, Efficient Sampling and Mass Spectrometric Detection			30.0
PN94023	913	Development of Laser-Diode Based Sensors for Trace Isotope Assays	53.6	51.0	
PN95033	1009	Evaluation of Cellular Response to Insult		106.2	108.0
PN93129	847	Improved Analytical Ion Trapping Methods	90.6	108.5	
PN94052	942	Miniaturized Radiation Measurement Technology for Space Applications	20.4		
PN94062	952	Nonlinear Optical Imaging	52.8		
PN95074	1050	Size Measurement, Sorting and Chemical Analysis of Nanometer Sized Particles Using an Ion Trap		49.9	
PN96XXX	TBD	Theoretical and Experimental Study of 195Pt Solid NMR Shift Tensors			80.0
PN96XXX	TBD	Waste Tank Vapor Characterization of Polar Organic Constituents			25.0
		Subtotal	**427.7**	**416.4**	**495.0**
Computer and Information Sciences					
PN94001	891	4-DIVAS	14.8		
PN95004	980	Adaptive Life Simulator		49.2	
PN95007	983	Automated Document and Text Processing		97.7	90.0
PN96XXX	TBD	Automated Lung Ventilation Diagnosis			60.0
PN94015	905	Collaborative Environment Prototype for Molecular Science	108.4	180.9	249.0
PN93100	818	Computational Modeling of Complex Physical Systems	255.3		
PN95024	1000	Development of Intuitive User Interfaces		154.5	150.0
PN93100	818	Direct Numerical Simulation of Turbulence		12.5	
PN94029	919	Electronic Information Space for Molecular Science Research	21.8		
PN93124	842	Fourier Transform Ion Cyclotron Resonance Mass Spectroscopy Data Acquisition and Modeling	116.8	63.3	
PN95038	1014	Heterogeneous Information Systems Linkages		166.5	150.0
PN94038	928	Hypermedia-Based Training	26.1		
PN95046	1022	Information Systems Meta Data Investigation		24.9	
PN96XXX	TBD	Information Visualization			188.5
PN95055	1031	Medical Imaging 3D Reconstruction and Visualization		18.9	70.0
PN94053	943	Molecular Visualization on Parallel Computers	19.3	25.9	30.0
PN94059	949	Neural Network Data Processing for Sensor Applications	59.0	79.3	98.0
PN96XXX	TBD	On-Line Collaborative Instruments			98.0
PN93100	818	Parallel TEMPEST		20.1	
PN94070	960	Prototype a Collaborative Scientific Work Environment	55.4		
PN93100	818	Subsurface Transport in Heterogeneous Materials		28.6	
		Subtotal	**676.9**	**922.3**	**1183.5**

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Design and Manufacturing Engineering					
PN95045	1021	Industrial Modeling Expert		36 0	
PN95060	1036	Microscale Freeform Fabrication Using Electron-Beam Curing		6 7	
PN95075	1051	Solid Freeform Fabrication of Ceramic Components		55 3	
		Subtotal	**0.0**	**98.0**	**0.0**
Ecological Sciences					
PN94002	892	A Framework for Integrating Global Environmental Change Technologies Across Multiple Spatial and Temporal Scales	51 8		
PN94020	910	Demand-Side Management Tool for Allocation of Water Resources	32 9		
PN94021	911	Developing Capability for Global Studies to Anticipate Changes in Vegetative Cover	52 0		
PN95029	1005	Ecological Modeling of Regional Responses to Global Change		340 1	300 0
PN94032	922	Evaluation of DNA Fingerprinting of Salmonids	26 5		
PN93132	850	Integrated Systems Ecology as an Approach for Unifying Global Change Issues	206 3		
PN95065	1041	Optimal Decision-Making for Water Resource Management		30 0	
PN95067	1043	Phytomechanics Using Plants as Physiological Transducers		37 2	
PN95070	1046	Prototype Map-Based Information Management System		21 9	
		Subtotal	**369.5**	**429.2**	**300.0**
Electronics and Sensors					
PN95002	978	A Real-Time Adaptive Intelligent System for Sensor Validation		150 0	100 0
PN96XXX	TBD	Automotive Exhaust Sensor for Engine Control			50 0
PN92018	736	Chemical Sensors	450 0		
PN94018	908	Cylinder Design for Reduced Emission Origins	62 6	100 3	80 0
PN95027	1003	Development of Two-Dimensional Electrochemistry for Sensor Applications		30 7	
PN96XXX	TBD	Genetically Engineered Sensors			120 0
PN96XXX	TBD	Imaging the Neurological Mental Processing of the Human Brain			100 0
PN96XXX	TBD	Liquid Metal Micropump			30 0
PN95051	1027	Low Cost Sensing Technology for O&M Applications		150 8	200 0
PN93137	855	Materials Evaluation	91 1	119 0	
PN95064	1040	Optical In Vivo Blood Characterization and Multivariant Analysis		38 6	20 0
PN96XXX	TBD	Portable Ultrasensitive Biological Sensor			85 0
PN95068	1044	Process Control System Development		39 0	
PN95072	1048	Remote Automobile Performance and Emission Monitor		28 9	
PN91071	705	Sonar Impulse Target Strength Holography	47 0		
PN93164	882	Spectroscopy Holography	50 0		
PN94083	973	Ultrasonic Measurement of Elastic Properties of Bone	15 5	40 6	20 0
PN93170	888	Video-Based Imaging Interferometry	33 7		
		Subtotal	**749.9**	**697.9**	**805.0**

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Health Protection and Dosimetry					
PN95011	987	Capillary Neutron Focusing for Boron Neutron Capture Therapy		45 1	
PN94013	903	Chemical Dosimetry	15 9		
PN95021	997	Detection of H Pylori Infection Using Laser Breath Analysis Instrumentation		43 3	50 0
PN95023	999	Development of High-Sensitivity Detection Techniques for the Measurement of Ionizing and Non-		23 2	
PN94035	925	Human Metabolic Parameter Development for PBPK-Based Breath Analyzer Model	16 7		
PN93147	865	PBPK-Based Breath Analysis Instrumentation Demonstration	93 8	112 6	92 0
PN94068	958	Physiologically Based Pharmacokinetic Modeling of Organic Waste-Site Chemicals	28 8	66 3	
PN95071	1047	Quantitation of Hypoxic Cells		48 9	
PN96XXX	TBD	Radium Complexation and Linkage to Monoclonal Antibodies for Cancer Therapy			125 0
PN96XXX	TBD	Radium-223 Immunoconjugates for Cancer Therapy			65 0
PN94072	962	Real Time Dosimetry for Therapeutic Radiation Delivery	29 0	93 0	
PN94079	969	Testing of Noise Instruments for RF/MW Interference	20 0	10 0	
		Subtotal	**204.2**	**442.4**	**332.0**
Human Systems Performance					
PN95042	1018	Human Factors Evaluation of Immersive Virtual Environments Technology		98 5	30 0
PN95047	1023	Interactive Technologies for Adaptive Training		19 9	
PN95050	1026	Light at Night		100 6	
PN94071	961	Re-Engineering Business Processes	19 9		
PN95087	1063	Translating Work Environment Research Into Design		22 7	
		Subtotal	**19.9**	**241.7**	**30.0**
Hydrologic and Geologic Sciences					
PN93092	810	Aquifer Heterogeneity	23 6		
PN96XXX	TBD	Development of a PC-Based Watershed Modeling and Visualization Package			40 0
PN93114	832	Dual-Gas Tracer Characterization of Diffusion Limitations in Enhanced In Situ Remediation	30 2	19 7	
PN94026	916	Effect of Microbial Biofilm on Sorption in Sediments	55 3		
PN94028	918	Electrolyte Diffusion - Molecular Dynamics and Transport Modeling	47 1		
PN96XXX	TBD	Experimental and Theoretical Study of Oxyanion Chemistry on Mineral Surfaces			175 0
PN95035	1011	Formation of a Contaminant Barrier by Injecting Metallic Iron Colloids Into the Subsurface		39 9	100 0
PN93131	849	Integrated Environmental Monitoring	398 0	151 9	
PN92048	766	Integrated Regional Climate Change	158 1		
PN91043	677	Integration of Molecular Research with Environmental Phenomena	63 2		
PN95048	1024	Interpretation of Single-Well Tracer Tests		22 1	
PN95058	1034	Microbiological Controls on Contaminant Behavior		142 7	120 0
PN95062	1038	Monitoring Technology for Water Control Facilities		10 3	
		Subtotal	**775.5**	**386.6**	**435.0**

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Integrated Technology Policy and Regulatory Analysis					
PN94004	894	A New Approach to Foreign Policy	13.2		
PN95026	1002	Development of Meso-Level Perspectives for Modeling the Global Environmental Consequences of		107.7	
PN93119	837	Ethical, Legal, and Social Implications of the Human Genome Project	14.3	6.4	
PN94042	932	Integrated Climate Change Analyses - A Pilot Study	85.8	22.1	
PN96XXX	TBD	Integrated Environmental Decision Support Tool			50.0
PN94063	953	North American 3E Model	175.7	123.3	
PN93156	874	Prototype for Integrating Total Energy Cycle (TEC) and Product Life Cycle (PLC) Assessments	54.0		
PN94073	963	Screening Life-Cycle Assessment	38.7		
PN92077	795	Solid Waste Material Flow Modeling	126.4		
PN92079	797	Technological Response	122.1		
PN95084	1060	Technology Adoption Study		40.0	
PN94085	975	Valuation of Non-Glamorous Natural Resources	89.3		
		Subtotal	**719.5**	**299.5**	**50.0**
Marine Sciences					
PN95025	1001	Development of Lagrangian Particle-Tracking Method for Quantifying Fluxes in the Near-Shore		31.6	50.0
PN94074	964	Semipermeable Membrane Devices for Sampling Nonpolar Organic Compounds in Air, Water and	37.7	19.8	
		Subtotal	**37.7**	**51.4**	**50.0**
Materials Science and Engineering					
PN92002	720	Advanced Catalysts and Catalytic Processes	100.3		
PN96XXX	TBD	Advanced Energy Storage Materials			50.0
PN96XXX	TBD	Advanced Spot Welding of Aluminum Sheet			35.0
PN95009	985	Bioactive Coatings and Composites for Orthopedic Devices		36.3	
PN95012	988	Catalytic Materials Synthesis		43.8	
PN94014	904	Coatings Characterization	69.9	49.3	50.0
PN96XXX	TBD	Development of Improved Oxygen Electrolyzer Membranes			70.0
PN95028	1004	Development of Ultracapacitor Materials		27.6	
PN94024	914	Diamond-Like Carbon Coatings	54.2		
PN96XXX	TBD	Die Casting Materials			18.0
PN96XXX	TBD	Dissolvable Stents			40.0
PN96XXX	TBD	Gas Selective Thin Film Barrier Materials			66.3
PN95036	1012	Glass Structure, Chemistry, and Stability		114.4	98.0
PN96XXX	TBD	High Performance Barrier Coatings Using Polymer Multilayers			50.0
PN96XXX	TBD	High Porosity Dielectric Films Through Biomimetic Processing			100.0

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
PN95041	1017	High Temperature Catalytic Materials		101 7	100 0
PN94036	926	Hydrocarbon Trap Materials	30 1		
PN92045	763	In Situ Monitoring of Ultra-Fine Particle to Particle Material Interactions	89 2		
PN95044	1020	Industrial Applications of High Surface Area Supported Metal Catalysts		30 0	
PN96XXX	TBD	Intelligent Organic/Inorganic Composites			75 0
PN96XXX	TBD	Low Cost Microchannel Heat Exchangers			65 0
PN96XXX	TBD	Materials Synthesis and Processing for Flat Panel Displays			50 0
PN95053	1029	Matrix Crack Insensitive Composite Materials		52 0	
PN94049	939	Mesoporous Materials	149 5	146 3	150 0
PN94055	945	Nanoparticle Materials Development	83 5		
PN94056	946	Nanoparticle Processing	98 3	95 0	100 0
PN94057	947	Nanoparticle Science	104 5	92 4	100 0
PN96XXX	TBD	Near Net Shape Forming of Resorbable and Implantable Devices			50 0
PN93145	863	Novel Electrosynthesis of Organic Electroactive Polymers	40 1	50 7	
PN95066	1042	Ordered Mesoporous Membranes		81 7	120 0
PN95073	1049	Selective Oxidation in Membrane Reactors		41 8	
PN96XXX	TBD	Shape Selective Porous Catalysts			128 0
PN95077	1053	Solution Chemistry		120 4	175 0
PN92082	800	Superplastic Forming Aluminum Developed Multiwall Exhaust	99 7		
PN95079	1055	Supported Metal Catalysts		29 3	
PN95080	1056	Surface Modification		71 2	100 0
PN95081	1057	Synthesis of Model Inorganic Ion Exchange Materials		26 5	88 0
PN92082	800	Transportation Materials			
PN94082	972	Ultrafine Nitride Powders by RTDS	9 5		
		Subtotal	**928.8**	**1210.4**	**1878.3**

Molecular Science

PN95005	981	Adsorption on Fe-(hydr)oxides Under Nonequilibrium Conditions		26 9	
PN94011	901	Bonding and Structure of Organic Ligands at Oxide/Water Interfaces	144 2	269 7	147 0
PN94012	902	Catalytic Chemistry of Metal Oxides	42 3	80 3	139 0
PN93098	816	Characterization of Structure and Dynamics of Surface Adsorbates and Their Surfaces	123 1	146 9	
PN95016	992	Colloid-Colloid Interactions. Forces and Dynamics		101 8	100 0
PN92021	739	Computer Modeling of DNA Perturbations	74 8		
PN96XXX	TBD	Development of a Flowing Liquid-Liquid Interface Apparatus for Measurements of Interfacial and			60 0
PN95030	1006	Effects of Surface Complexation and Structure on the Dissolution Precipitation Kinetics of		22 2	
PN93109	827	Elastic Properties, Solution Chemistry, and Electronic Structures of Oxides, Silicates, and	150 7	174 9	
PN93115	833	Environmental Catalysis	43 3	65 2	
PN95034	1010	Flow Injection Analysis		102 7	117 0
PN93123	841	Fourier Transform EPR Studies of Radiation-Induced Structural Alternation of DNA	85 5	88 0	44 0

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
PN92043	761	High Field NMR and NMR Imaging	122 3	26 7	
PN95040	1016	High Resolution and Solid State NMR Studies of Proteins and DNA-Adducts		70 4	93 0
PN94039	929	Identification and Structural Determination of Paramagnetic Species Using Pulsed EPR	79 6	109 0	118 0
PN92018	736	Interphase Chemistry	375 9		
PN92053	771	Magnetic Resonance Spectroscopy	220 8	105 0	
PN95052	1028	Magnetic Resonance Spectroscopy Studies of Glasses, Minerals and Catalysts		120 3	196 0
PN93138	856	Materials Surface and Interface Chemistry	158 1	90 4	
PN96XXX	TBD	Mechanism of Biotransformation of Environmental Contaminants			142 0
PN95054	1030	Mechanisms of Radiolytic Decomposition of Complex Nuclear Waste Forms		73 9	100 0
PN93142	860	Multinuclear Solid-State NMR Characterization of the Early Forms of Mineralization	110 6	110 7	
PN96XXX	TBD	Near Field Spectroscopic Mapping and Manipulation of Enzymatic Reactions			142 0
PN94060	950	NMR Studies of Altered-DNA/Protein Complexes	99 0	125 5	118 0
PN95063	1039	NMR Studies of Proteins		50 8	147 0
PN94064	954	Novel Synthesis of Metal Cluster-Polymer Composite	192 4	133 0	157 0
PN94065	955	Numerical Solution of the Schroedinger Equation	42 4	62 1	98 0
PN93154	872	Properties of Soft X-Ray Absorption and DNA Damage by Synchrotron Radiation	61 6		
PN95069	1045	Protein-DNA Complexes Dynamics and Design		151 8	216 0
PN96XXX	TBD	Rational Design and Testing of Actinide-Selective Ligands			98 0
PN92076	794	Site Specific DNA Damage by Radiation and Chemicals	79 0		
PN95076	1052	Solid State Multisensor Array		115 9	
PN96XXX	TBD	Speciation of Uranyl Aqueous and Surface Complexes by Cryogenic Spectroscopic Methods			120 0
PN94075	965	Spectral Mapping of the V4 Band and Determination of the Molecular Constraints for the Chlorine	63 8		
PN95078	1054	Spectroelectrochemistry		201 1	182 0
PN91072	706	Spectroscopy Techniques for Analysis of DNA Damage	76 0		
PN93165	883	Structural and Kinetic Studies at Model Oxide Surfaces	305 8	212 2	
PN94078	968	Synthesis of Site-Specific Lesions	62 6		
PN96XXX	TBD	The Development of a Dissociative Model for Water			60 0
PN94080	970	The Effect of Individual Alpha Particle Tracks on Expression of Regulatory Proteins in Individual	94 6		
PN95086	1062	Theoretical and Computational Molecular Science Research		27 0	
PN94081	971	Tumor Formation in cells and Tissues Studied by Means of Liquid-State and Solid State NMR	50 8	86 6	80 0
PN94086	976	X-Ray Adsorption Fine Structure	415 8	381 8	395 0
		Subtotal	**3275.0**	**3332.8**	**3069.0**
Nuclear Science and Engineering					
PN94010	900	Boiling Water Reactor (BWR) Advanced Fuels	6 5	10 4	
PN92049	767	International Reactor Safety	141 1		
PN92085	803	Weapons-Grade Plutonium Denaturing	48 5		
		Subtotal	**196.1**	**10.4**	**0.0**

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Process Science and Engineering					
PN92003	721	(Synthesis of) Advanced Coatings	193 3		
PN94005	895	Advanced Instrumentation Real-Time Acoustic Planar Imaging of Dense Slurries (RAPIDS)	59 2	85 3	100 0
PN93146	864	Analytical and Reaction Chemistry	84 2	76 6	
PN94009	899	Biodegradable Electrostatic Filter Development	25 7	10 5	
PN91011	645	Catalyst and Membrane Research/Chemical Process Efficiency			
PN91011	645	Catalyst Development and Testing	181 1	93 2	
PN93118	836	Ceramic Permeation Membranes	29 5	10 0	
PN95015	991	Characterization of Rapid Dechlorinators Remediation of DNAPL		166 4	129 0
PN96XXX	TBD	Chemical Process and Reactor Modeling for Innovative Conversion Processes			133 0
PN95017	993	Colloidal Waste Science		64 2	
PN94016	906	Computational Modeling of the Rheology of Dense Suspensions	36 0		
PN94019	909	Decontamination and Remediation of Metallic Process Components by Electrical Heating	24 1		
PN93106	824	Development of a Selective Solid TRU Extractant	44 2		
PN96XXX	TBD	Development of Small-Scale Reformer for Hydrogen Production			142 0
PN94027	917	Electric Field and Current Modeling of Electric Discharge Processing	43 3	44 7	
PN95031	1007	Electroactive Materials		147 5	250 0
PN95032	1008	Electroconversion		114 8	200 0
PN94067	957	Enhanced Mixing for Supercritical Fluid Oxidation - Phase Separations	69 9	217 1	175 0
PN94031	921	Evaluation and Selection of In-Well Separations	20 0	14 5	
PN92038	756	Experimental Investigation of Pipe Flows of Complex Fluids	210 6	148 6	
PN92082	800	Flash Evaporated Monomers	78 5		
PN92038	756	Fluid Dynamics Laboratory Research			
PN93146	864	Fundamental Reaction Diagnostics/Kinetics	106 7	73 9	
PN92038	756	Homogeneous Isotopic Turbulence	113 6	48 5	
PN94037	927	Hydrogen Separation Technology Using the CHASP Process	21 0	39 5	
PN94040	930	In Situ Bioremediation of Non-Aqueous Phase Liquids	39 8		
PN94041	931	In Situ Containment Using Heat-Enhanced and Carbonate Barriers	40 4	33 8	
PN94043	933	Investigation of a Treatment Process for Organic Wastes	27 3		
PN94044	934	Ionizing Radiation Assisted Processing of Hazardous Wastes	97 6	159 6	196 0
PN95049	1025	Isolation and Use of Extremophilic Bacteria for the Treatment of High Nitrate and Sulfate		97 4	86 0
PN92038	756	Jet Flows of Complex Fluids	35 5		
PN94045	935	Kinetics, Scale-up and Demonstration of Uranium Bioprecipitation Technology	83 1	139 9	18 0
PN96XXX	TBD	Liquid Corona Process Development and Novel Electrode Scaleup			45 0
PN94046	936	Mediation of Combustion Hydrocarbon Emissions	14 0		
PN94047	937	Membrane Materials	81 8	90 8	
PN94048	938	Membrane Separations	148 4	95 4	130 0
PN96XXX	TBD	Microchannel Separations			60 0
PN95059	1035	Microplasma Reactor		20 7	45 0

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
PN93140	858	Microtechnology Applications in Waste and Chemical Processing	15 9		
PN96XXX	TBD	Mixed Waste Treatment With Iron Reducing Bacteria			44 0
PN95061	1037	Modeling of Colloidal Systems		36 3	
PN94058	948	Nanoparticle Synthesis	99 2		
PN92038	756	Non-Newtonian Fluid Dynamics Measurements	46 7		
PN96XXX	TBD	Nonaqueous Based Processing			50 0
PN93146	864	Organic Conversion			
PN92038	756	Particle-Induced Turbulence	5 3		
PN93146	864	Plasma Engineering and Prototype Development	211 1	162 7	75 0
PN96XXX	TBD	Production of Foreign Protein Pharmaceuticals Using Transgenic Plant Cell Culture			65 0
PN91011	645	Reaction Engineering	201 9	187 8	
PN94076	966	Structure/Function Analysis	85 1	95 9	100 0
PN94077	967	Supercritical Fluid Separations	93 8	93 7	95 0
PN95082	1058	Synthesis Reactions in a High Energy Corona		130 6	150 0
PN95088	1064	Ultra High Rate Sputter Deposition of Highly Reflective Metal Films		51 7	50 0
PN94084	974	Vacuum Extruded Polymer Films	53 7	96 5	100 0
PN95091	1067	Vining Plant Control		19 8	
		Subtotal	**2721.5**	**2867.9**	**2438.0**
Risk and Safety Analysis					
PN95003	979	A Tribal Risk Model		20 1	
PN95013	989	Cell and Tumor Growth Kinetics		114 2	127 0
PN95014	990	Cell Signaling Mechanisms		150 5	167 0
PN95019	995	Comparative Metabolism and Pharmacokinetics		39 5	106 0
PN96XXX	TBD	Data Quality Analyses for Risk and Environmental Assessment			35 0
PN94022	912	Development of a Chemical Carcinogenic Risk Calculation Program	12 2		
PN95022	998	Development of Environmental Dosimetry Modeling Parameter Database Editor		29 0	
PN93127	845	Direct and Indirect Genotoxic Mechanisms		92 9	61 0
PN93127	845	Health Protection and Standards for Hazardous Chemicals	137 9	24 4	
PN96XXX	TBD	Risk-Based Hydropower Refurbishment Methodology Development			25 0
PN95083	1059	Technical Analysis and Integration of Health Effects Data		77 6	51 0
		Subtotal	**150.1**	**548.2**	**572.0**

Pacific Northwest National Laboratory's LDRD Projects by Core Technical Capability From FY 1994 Through FY 1996

Study Control #	Lab Ref. #	Project Title	FY94	FY95	FY96
Statistics and Applied Mathematics					
PN94017	907	Computer Intensive Methods of Hypothesis Testing	23.5		
PN93103	821	CW Molecular Discriminator	25.0		
PN96XXX	TBD	Environmental Statistical Sampling Design Framework Tool			30.0
PN93151	869	Probabilistic Finite Element Analysis	19.7		
PN96XXX	TBD	Property Prediction From Molecular Dynamics Simulation			35.0
PN95085	1061	The Development of Adjoint Sensitivity Methods for Complex Physical and Chemical Simulation		33.5	
PN93169	887	Uncertainty Analysis for Computer Models	58.4	34.9	
PN96XXX	TBD	Use of Wavelet Methods for the Homogenization of Dynamics			42.0
		Subtotal	**126.6**	**68.4**	**107.0**
Thermal and Energy Systems					
PN94006	896	Advanced Numerics and Visualization for Power Systems	33.9	80.9	55.0
PN94007	897	Advanced Power System Dynamic Stability Assessment	73.1	91.1	
PN94008	898	Artificial Intelligence for Power System Control	119.2	159.9	160.0
PN95018	994	Compact Spiral Composite Evaporative Cooler		11.8	
PN93110	828	Electric Motor/Pump Diagnostician	178.4		
PN94033	923	Exhaust System Thermal Management	15.7	67.5	
PN95037	1013	Heating Plant Maintenance Training System		49.9	
PN95039	1015	High Performance Micro Heat Engine Development		48.6	100.0
PN93139	857	Micro Heat Exchanger Development	146.3	159.3	58.0
PN94051	941	Microcompressor Development	138.1	200.3	150.0
PN96XXX	TBD	Microscale Air-Side Heat Transfer Enhancement			65.0
PN93139	857	Microscale Heat Exchanger and Heat Pump Architecture Development			
PN93139	857	Microscale Sheet Architecture Prototype Development	190.7	140.8	
PN94054	944	Motor/Machinery Failure Analysis by Holographic Processing of Acoustic Signatures	46.8		
PN94066	956	Off-Peak Cooling by Direct Contact, Open or Closed Cycle Ice-Making	27.3	41.6	
PN94069	959	Portable Dynamic Analysis and Design System	104.0	101.2	
PN92067	785	Power System Dynamic Analysis (aka Pulsed Amplitude Synthesis and Control Development	52.0	59.7	
		Subtotal	**1125.5**	**1212.6**	**588.0**
Toxicology					
PN92083	801	Use of Proliferating Cell Nuclear Antigen (PNCA) Assay to Quantify Cell Proliferation in Respiratory Tract and Other Target Tissues of Rodents Inhaling Xenobiotics	4.7		
		Subtotal	**4.7**	**0.0**	**0.0**
		TOTAL	13684.1	14937.8	13633.8

Sandia National Laboratories

Listing

of

Laboratory Directed Research and Development (LDRD) Projects

for

Fiscal Years 1994, 1995, and 1996

April 4, 1996

Note: There are three separate listings by fiscal year. A project started in FY 1994 and ending in FY 1996, for example, appears in each of the three listings. The attribution of significant support to DOE program areas may change as the project matures from one year to the next.

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Catalytic Carbon Foam	3501010000	•	•		•	•	•			•	347	0	0
Superconducting Positioner and Accelerometer Development	3501020000	•	•	•			•		•	•	155	0	0
Nanoscale Engineering of Smart Membranes	3501030000	•	•		•	•				•	279	0	0
Passive Micromechanical Tags	3501050000										150	0	0
Biomimetic Processing of Oriented Crystalline Ceramic Layers	3501080000				•	•				•	368	0	0
Fullerene-Based Materials Research and Development	3501090000	•								•	394	0	0
Low-Dielectric and High-Temperature Films for Multichip Modules	3501120000	•							•	•	204	140	0
A Novel Approach for Forming Thick, Patterned Diamond	3501130000	•							•	•	314	0	0
Atomic Layer Epitaxial Growth of Diamond Using Halogenated Gases	3501140000	•		•	•				•	•	400	374	0
Advanced Materials for Biomedical and Aerospace Applications	3501150000	•							•		365	181	0
The Fundamental Science of Nanometer-Size Clusters	3501160000	•			•					•	316	0	0
Development of a Scaleable, Flat-Flame Technology for the Synthesis of Diamond F	3501170000	•							•	•	401	339	0
Synthesis of Ceramics Using Supercritical Fluids	3501190000	•			•					•	302	301	0
Dynamics of Nucleation in Chemical Vapor Deposition	3501210000	•		•		•				•	333	331	0
Polyphosphazenes: New Conducting Hybrid Organic-Inorganic Materials	3501220000								•	•	277	261	0
Template-Mediated Ontogenesis: A Novel Approach to Mesomorphic Materials	3501230000	•	•			•			•	•	256	356	0
Feasibility Study for Electron Beam Joining of High Temperature Ceramics	3501240000	•			•		•		•	•	313	0	0
Molecular Adhesion Including Chemical Reactions at Polymer-Solid Interfaces	3501250000	•	•		•	•				•	365	349	0
Gas Separation by Fullerene Membranes	3501260000	•	•		•	•					287	311	0
Adaptive Scanning Probe Microscopies	3501270000	•			•	•				•	117	379	290
An Interactive Multi-Dimensional Approach for Visualizat	3503020000	•		•		•				•	315	0	0
Modeling Complex Chemically Reacting Flows on Massively Parallel Supercomputers	3503060000				•	•	•		•	•	524	0	0
Machine Learning for Robot Motion and Task Planning	3503090000	•		•						•	249	0	0
Integrated Structural Control Design of Large Structures	3503110000	•	•						•	•	366	0	0
Electromechanical Gels	3503120000	•	•						•	•	326	0	0
Structural System Identification	3503130000	•	•		•	•			•	•	386	0	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY93	FY96
Linear Scaling of Density Functional Algorithms	3503150000					•				•	277	214	0
Efficient Parallel I/O: Building an Infrastructure for Massively Parallel Comput	3503160000	•				•	•				267	0	0
Pseudospectral Electronic Structure Algorithms for Massively Parallel Computers	3503170000	•	•			•	•				393	0	0
Massively Parallel Computing for Compressible Gas Dynamics	3503180000	•		•		•	•		•		420	0	0
Increasing the Chemical Content of Turbulent Flame Models Through the use of Par	3503190000	•			•	•	•				308	291	0
Massively Parallel Simulation of 3-D Non-Continuum Fluid Flow for Space and Micr	3503210000	•		•	•	•				•	298	0	0
Atomic Scale Studies of Semiconductor Surface Defects	3503250000	•		•	•	•					290	0	0
Animation of Flexible Robotic Structures	3503260000	•	•						•	•	421	0	0
A Configuration Space Toolkit for Automated Spatial Reasoning	3503270000	•							•		224	237	0
Coordinating Robotic Motion, Sensing, and Control in Plans and Execution	3503280000	•							•		252	256	160
An Object-Oriented Finite Element Code Architecture for Massively Parallel Computers	3503290000	•	•								367	347	0
Parallel Optimization Methods for Agile Manufacturing	3503310000	•			•	•				•	425	364	426
Massively Parallel Simulation of Grain Boundary Evolution	3503320000	•			•	•	•	•	•		287	317	0
Collective Dynamics of Minimally Cognitive Objects	3503330000	•									129	148	0
A Hybrid Solution to the Electrocardiographic Inverse Problem	3503340000									•	405	273	0
Self Repairing Control for Damaged Robotic Manipulators	3503350000	•	•						•	•	376	381	368
A Unique Capability: 3-D Electromagnetic Inversion on Massively Parallel Machines	3503360000		•		•	•	•			•	166	197	0
Physical Simulation of Nonisothermal Multiphase Flow in Porous Media	3503370000	•	•						•	•	490	437	486
A High Performance Multiprocessor Architecture for Real-Time Intelligent Systems	3503380000	•	•				•				296	331	0
Electronic and Geometric Structure of Transition-Metal Nanoclusters	3503390000	•	•		•	•					268	289	0
Monte Carlo Simulation of Radiation Heat Transfer in Reacting Flows by Massively	3503410000	•			•	•	•			•	298	316	326
Use of High Index Substrates to Enable Dislocation Filtering in Large Mismatched	3505010000	•		•	•	•			•	•	394	0	0
AlInGaP Materials for Visible Photonic Devices	3505020000	•							•	•	353	0	0
Microelectronic Silicon-based Chemical Sensors: Ultra-Detection of High Value M	3505040000	•		•					•	•	232	0	0
Enhanced Vertical Current Transport in Superlattices for High-Performance Vertic	3505070000	•		•					•	•	266	0	0
Mid-Wave Infrared (MWIR) Diode Laser With Strained, III-V Active Regions	3505080000	•	•	•		•	•		•		302	0	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Micro-Optical Elements Development	3505140000	•								•	321	0	0
Advanced Packaging Technology for High Frequency Photonic Applications	3505150000	•		•		•			•	•	397	407	0
Smart Substrates - Making Multichip Modules Smarter	3505160000	•		•					•	•	347	0	0
Ultra High Speed Optical and Electronic Distributed Devices	3505170000	•							•	•	361	0	0
Enhanced Analysis of Complex Gas Mixtures by Pattern Recognition of Microsensor	3505180000	•	•	•			•				328	230	0
Non Invasive Current and Voltage Imaging Techniques for Integrated Circuits	3505190000	•		•					•	•	166	0	0
Novel Thin Film Field Emission Electron Source	3505210000	•							•	•	275	0	0
Quantum Confinement and Light in Silicon Nanostructures	3505220000	•	•	•	•	•			•	•	299	0	0
Monolithically Integrated Active Waveguides and Lasers using Rare-Earth-Doped Sp	3505230000	•							•	•	340	260	0
InP-based Materials for Photonic and Microelectronic Devices	3505260000	•	•			•			•	•	408	404	428
New Techniques for Non-Linear Time-Optimal Control of Photolithography Position	3505270000	•								•	266	0	0
Tunneling Heterostructure Devices for Millimeter-wave and High-speed Low-power L	3505280000	•							•	•	371	354	390
Microsensors for In-Process Control and Monitoring during Semiconductor Fabricat	3505290000	•	•	•	•		•			•	314	335	380
Incorporation of Wavelength Selective Devices into Waveguides with Applications	3505310000	•	•							•	311	302	0
Advanced Processes for Synthesis of Optical Amplifier- and Waveguide-Materials	3505320000	•		•	•					•	308	193	0
Numerical Modeling of Vertical Cavity Semiconductor Lasers	3505330000	•								•	190	177	0
Smart Packaging for Photonics	3505340000	•		•		•			•	•	353	358	335
Microfabricated Combustible Gas Detetor	3505350000	•	•		•	•	•		•	•	316	340	401
Integration of Diffractive Optics and VCSEL Arrays for Optical Interconnects	3505360000	•		•					•	•	341	367	404
A Novel Experimental/Numerical Technique for the Mechanical Characterization of	3505370000	•			•	•			•	•	219	238	0
Photonic Integrated Circuits for Millimeter Wave Generation	3505380000	•							•	•	364	379	412
A General Approach for Analyzing Composite Structures	3507060000				•						369	330	0
Moving/Deforming Meshes for Computational Fluid Dynamics and Heat Transfer	3507070000				•	•					400	0	0
Optical Diagnostics for Turbulent and Multiphase Flows	3507080000		•		•	•	•			•	424	0	0
Modeling of Sliding Interfaces	3507110000	•			•	•			•	•	311	0	0
Study of Electrokinetic Effects to Quantify Groundwater Flow	3507130000	•	•			•	•			•	50	0	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
High Resolution Seismic Source for Environmental and Geotechnical Applications	3507140000		•			•	•			•	275	0	0
An Innovative Computational Technique for Multi Fluid Processing Flows	3507150000	•			•				•	•	326	196	0
Precision Shape Control using Smart Material Systems	3507160000	•			•	•			•	•	360	353	0
Process Control of Large-Scale Finite Element Simulation Software	3507170000	•					•	•		•	231	226	0
The Virtual Test Environment	3507180000	•							•	•	347	374	0
Numerical Simulation of Fracture and Failure Processes in Solid Continua	3507190000	•			•	•		•	•	•	278	389	0
A Novel Gridless Technique for Fluid/Structural Dynamic Coupling on Flexible Mem	3507210000	•			•	•			•	•	272	442	0
Health Monitoring of Structures Using Dynamic Analysis	3507220000	•			•		•	•	•	•	447	367	0
Repetitively Pulsed Ion Beam System for Surface Treatment	3509020000	•	•		•	•		•		•	442	366	0
A Long-Pulse High-Power Diode Based on a Microelectronic Emitter	3509030000	•	•		•				•	•	249	0	0
Development of Cost Effective High Average Power Pulsed Power Driver Concepts	3509040000	•	•		•	•				•	308	0	0
Contamination Free Manufacturing	3513020000	•	•		•	•			•	•	354	0	0
Programming of Assembly of Fully 3-D Mechanisms	3513050000	•							•		405	0	0
Generic Programming Languages for Manufacturing Processes	3513060000	•	•						•	•	278	0	0
Multilayer Ceramic Sensor for High Resolution Weld Seam Tracking	3513110000	•			•					•	267	0	0
Resistance Girth Welding	3513120000	•	•		•				•	•	203	0	0
Development of Novel High Temperature Titanium Investment Casting Model Materials	3513130000	•							•		226	0	0
Materials and Corrosion Characterization Using the Confocal Resonator	3513140000	•								•	350	0	0
Computational Simulation of Solder Joint Failure	3513150000	•	•		•					•	292	0	0
Impedance Imaging Sensor For Nondestructive Evaluation Of Nonmetallic Components	3513160000	•			•					•	302	290	0
Increasing CNC Machine Agility Through Graphical Programming	3513170000	•								•	330	0	0
Agile Manufacturing of Products Made From Metal Sheet And Plate	3513180000	•				•				•	334	334	0
Advanced Processing of Printed Circuit Boards	3513190000	•							•	•	370	377	0
Rapid Prototype And Test	3513210000	•							•	•	286	314	0
Computational Model For The Prediction And Optimization Of Sintering In Manufact	3513220000	•								•	429	449	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Rapid Prototyping Of Composites Using Resin Transfer Molding	3513230000	•		•	•				•	•	323	300	0
Stereolithography Manufacturing Process Modeling And Optimization	3513240000	•		•	•				•	•	395	478	0
Fabrication of Near-Perfect Optics	3513250000	•		•						•	133	284	0
Explosively Driven Ionized Plasma Jet Generator for Magnetohydrodynamic	3513280000	•							•		339	327	0
Non Invasive Scanning Techniques for Prosthetic Rehabilitative Medicine	3514020000	•							•	•	362	0	0
Designed Supramolecular Assemblies For Biosensors And Photoactive Devices	3514040000									•	264	266	378
Integrated-Optics-Based Ballistic Imaging System For Biomedical Diagnostics	3514050000									•	341	393	0
A Human Factors Engineering Approach to Biomedical Decision Making	3514060000	•							•	•	196	0	0
Decision Trees And Integrated Features For Computer Aided Mammographic Screening	3514070000									•	286	251	357
A New Approach to Protein Function and Structure Prediction	3514080000					•				•	130	207	243
Spent Fuel Characterization Measurement System	3515010000	•	•					•		•	182	0	0
Metal-Loaded Polymer Films for Chemical Sensing of ES&H-Related Pollutants	3515030000		•							•	177	0	0
Radioactive Waste Processing Using Titanate Ion Exchangers	3515050000	•						•			133	0	0
An Environmentally Safe Rechargeable Battery	3515070000	•	•		•				•	•	302	0	0
Formation Blocking in Bioremediation	3515080000	•	•								273	221	0
Using a Prehistoric Waste Disposal Site as a Natural Analogue for the Validation	3515090000	•	•								292	267	0
Quartz Crystal Microbalance (QCM) Arrays for Solution Analysis	3515110000	•	•		•	•			•	•	366	411	0
Radiation Hardened Robotics (RHobot) -- A Basic Investigation of Feasibility	3515130000	•	•			•		•	•	•	337	413	0
Integrated Geophysical Monitoring of Oil Spills and Their Remediation Process	3515140000		•			•	•			•	332	193	0
Field-Deployed Optical Remote Sensing For Environmental Monitoring	3515160000	•	•								320	309	0
Development Of A Portable X-Ray And Gamma-Ray Detector Instrument And Imaging Ca	3515170000	•	•	•				•	•	•	335	290	352
Sensor Fusion And Diagnostics Methods For Characterization Of Hazardous Environm	3515180000	•	•	•							379	321	0
Automated Detection And Reporting Of Volatile Organic Compounds (VOC's) In Comp	3515190000	•	•							•	598	968	467
Delineating DNAPLs: A Probabilistic Approach For Locating DNAPLs In Subsurface S	3515210000		•			•				•	365	309	461
Reduced Source Term Uncertainty Through Control Of Long-Term Geochemical Environ	3515220000	•	•								258	249	0
Data And Image Fusion For Geometrical 3-D Cloud Characterization	3515230000	•				•				•	261	334	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Molecular Dynamics of Gases and Vapors in Nanoporous Solids	3515250000		•		•	•	•			•	156	174	0
Compact Environmental Sensing Spectroscopy Using Advanced Semiconductor Light Em	3515260000	•	•	•	•				•		317	327	412
Viability of Asynchronous Transfer Model (ATM) in Local Area Network (LAN) Environment	3517020000	•								•	163	0	0
End-to-End Encryption Technology for Gigabit Networking	3517030000	•		•						•	445	0	0
Extremely Secure Identification Documents	3517040000	•		•					•	•	283	0	0
Desktop Video Conferencing and Collaborative Engineering	3517060000	•								•	235	0	0
Lossless Compression of Instrumentation Data	3517070000	•		•					•	•	292	277	0
Performance Modelling and Strategy Identification for Network Data Services	3517080000	•								•	98	0	0
Supra-Gigabit/Second (Gb/s) Computer Communication Technologies	3517090000	•								•	481	421	0
The Quantification Of The Surety Of An Information System	3517110000	•		•					•	•	436	345	0
Learning Efficient Hypermedia Navigation	3517120000	•								•	390	367	295
An Enabling Architecture For Information Driven Manufacturing	3517130000	•	•		•					•	335	449	484
Network Protocol Toolkit For Enhanced Performance In Distributed And Real-Time C	3517140000	•			•	•	•			•	385	223	0
Automatic Planning and Programming for Robotic Construction of Planetary/Lunar S	3519030000	•	•	•				•		•	343	0	0
Spaceborne Synthetic Aperature Radar (SAR)	3519040000	•	•	•		•				•	271	0	0
Broadly Turnable, Solid State Coherent Light Sources	3519090000	•	•	•					•	•	421	0	0
High Mobility Rover for Planetary Exploration	3519110000	•	•	•						•	466	0	0
Development of a Space-Qualified Short Wavelength Fourier Transform Spectrometer	3519130000	•		•		•					59	0	0
Soil Penetrating Synthetic Aperture Radar	3519140000	•	•	•		•	•		•	•	392	355	0
Multi-Sensor Data Fusion Algorithm Development	3519150000	•	•	•					•		240	272	0
Non-Precious Metal Macrocyclic Complexes for Airelectrodes in Fuel Cells	3521010000	•	•		•	•			•	•	317	0	0
Smart Vehicular Transportation Systems	3521040000								•	•	297	0	0
Simulation Computer Modeling of Transportation Systems	3521060000				•	•	•				244	0	0
Image Processing and Transmission Systems for Intelligent Traffic Monitors	3521070000	•		•					•		402	0	0
SRAM: A New Maglev Concept	3521110000	•			•		•			•	336	267	0
Fuel Cell Applications For Novel Metalloporphyrin Catalysts	3521120000	•			•	•	•			•	304	297	385

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Low-Speed Aerodynamics Of Ground Transportation Systems	3521130000	•	•		•	•	•			•	307	409	0
Public Transportation System Acoustic Analysis	3521140000	•							•	•	284	304	0
Analysis of a Rapid Rail/Electric Vehicle Intermodal System	3521150000	•			•	•				•	335	308	0
	3521160000				•						198	0	0
A Virtual Reality-based Intelligent Training System	3523010000	•		•					•		324	218	0
Retooling Engineering Education The Electronic Textbook	3523020000	•								•	238	0	0
Electro-Optical Switching Amplifier (EOSA)	3523030000	•	•		•	•			•		298	0	0
Development Of Magnetic Materials With Irreversible Thermal Behavior And Improve	3523040000	•		•					•	•	351	370	0
The Ultimate Heat Spreader. A Silicon Micro-Heat Pipe Substrate	3523050000	•			•				•	•	271	242	0
Haptic Feedback Device For Virtual Reality	3523060000	•							•	•	461	520	0
A New Concept for Very Low-Energy Detonators and Torches	3523090000	•				•			•	•	161	223	0
Photocatalytic Semiconductor Cluster for Fuel Production	3524010000		•		•						301	0	0
Advanced Materials Development for Multijunction Monolithic Photovoltaic Device	3524020000	•			•	•				•	362	348	0
Engineered Photocatalysis for Detoxification of Waste Water	3524030000		•		•					•	264	0	0
Solar Photocatalytic Conversion of Co2 to Methanol	3524040000		•		•					•	233	0	0
New Materials for Energy Conservation in Industrial Chemical Separations	3524050000	•	•		•	•				•	325	302	0
Advanced Tomographic Flow Diagnostics for Opaque Multiphase Fluids	3524060000	•	•		•	•	•			•	425	365	201
Selective Dehydrogenation Over Hydrous Titanium Oxide Supported Catalysis	3524070000					•				•	161	186	0
High Accuracy Integrated GPS/INS System	3525010000								•		398	0	0
Fusion of LADAR with SAR for Precision Strike	3525020000			•					•		385	0	0
Adverse-Weather Precision Guided Munitions	3525030000								•	•	358	0	0
Filtered Backprojection for Spotlight Synthetic Aperture Radar Image Formation	3525040000			•					•		60	0	0
Decision Support Aids for RSTAKA	3525050000			•					•	•	237	245	0
Intelligent Informatuon Integration And Fusion	3525060000	•	•	•					•	•	175	253	0
Precision Guided Parachute	3525070000									•	296	408	0
Sensor Data Fusion	3525080000			•					•		234	0	0

SNL LDRD FY94 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Electron Phase Coherent Effects in Nanostructures and Coupled 2D Systems	3539030000					•			•	•	504	0	0
Portable Neutron generator for Quick Detection of Hazardous Materials	3539050000	•		•				•		•	273	244	0
Micro-Miniature, Closed-cycle, Cryogenic Refrigeration	3539060000	•	•	•	•				•	•	299	0	0
A Novel Approach to Elemental Imaging in Three Dimensions	3539070000	•	•	•			•		•		169	0	0
New Technique Demonstrated for the Detection and Characterization of Optical	3539080000									•	184	0	0
A New Approach to Solutions of Nonlinear Partial Differential Equations	3539090000	•		•		•			•		114	0	0
Artificial Awareness for Robots: Using Artificial Neural Nets to Detect Unusual	3539120000	•								•	288	71	0
Advanced electronic Applications of Synthetic Diamond Films	3539130000	•							•		443	390	0
Evolution of Microstructure during Phase Separation	3539150000	•	•					•		•	314	180	0
Nanocavity Effects On Misfit Accomodation In Semiconductors	3539160000	•			•	•					270	230	286
Extending Applicability Of Cluster-Based Pattern Recognition With Efficient Appr	3539170000	•	•	•							255	241	108
Toward Solving The Optical Inverse-Scattering Problem: Using An Ultrashort Pulse	3539180000	•									168	151	0
Antipodal Focusing Of Shock Energy From Large Asteroid Impacts On Earth Did The	3539190000						•			•	119	129	157
Novel Quasi 3-Dimensionally Confined Structures	3539210000	•		•					•	•	215	192	0
Noncavity Laser Microscopy Of Cells For Early Detection Of Disease	3539220000				•					•	381	320	371
Prediction of Violent Mechanochemical Processes	3539230000	•		•					•	•	388	330	0

Legend
Mapping of DOE Program Areas to Codes

- A- Defense Programs
- B- Environmental Management
- C- Non-Proliferationa and NS
- D- Energy Efficiency and Renewable Energy
- E- Energy Research
- F- Fossil Energy
- G- Nuclear Energy
- H- Department of Defense (DOD)
- I Other-Strongly Support SNL Research Foundtions and other DOE PSO's

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Low-Dielectric and high-temperature films for multichip modules	3501120000	•								•	204	140	0
Atomic Layer Epitaxial Growth of Diamond Using Halogenated Gases	3501140000	•		•	•				•	•	400	374	0
Advanced Materials for Biomedical and Aerospace Applications	3501150000	•							•		365	181	0
Development of a Scaleable, Flat-Flame Technology for the Synthesis of Diamond Films	3501170000	•							•	•	401	339	0
Synthesis of Ceramics Using Supercritical Fluids	3501190000	•			•					•	302	301	0
Dynamics of Nucleation in Chemical Vapor Deposition	3501210000	•		•		•				•	333	331	0
Polyphosphaacetylenes: New Conducting Hybrid Organic-Inorganic Materials	3501220000	•			•	•			•	•	277	261	0
Template-Mediated Ontogenesis: A Novel Approach to Mesomorphic Materials	3501230000	•	•			•			•	•	256	356	0
Molecular Adhesion Including Chemical Reactions at Polymer-Solid Interfaces	3501250000	•	•		•	•				•	365	349	0
Gas Separation of Fullerene Membranes	3501260000	•	•		•	•					287	311	0
Adaptive Scanning Probe Microscopies	3501270000	•			•	•				•	117	379	290
Engineered Monodisperse Porous Materials	3501280000				•					•	0	282	326
Demonstration of Molecular-Based Transistors	3501290000	•		•	•	•			•	•	0	243	324
Chemical Functional of Oligosilanes: Economically Attractive Routes to New Photoresponsive Materials	3501310000	•				•				•	0	348	412
PbO-free composites for low temperature packaging	3501320000	•	•			•			•	•	0	249	294
Characterization and Correlation of Physical Properties of Ceramics Through Orientation Imaging Microscopy	3501330000	•					•		•	•	0	83	0
Atomic-Scale Measurement of Liquid Metal Wetting and Flow	3501340000	•	•		•	•					0	358	364
Synthesis and Processing of High Strength SiC Foams: A Radically New Approach to Ceramic-Ceramic Composite Materials	3501350000	•			•					•	0	322	379
Carbon Nanotube Composites	3501360000	•			•				•	•	0	315	351
Nanocomposite Materials Based on Hydrocarbon-Bridged Siloxanes	3501370000	•		•	•		•		•	•	0	394	431
New Adhesive Systems Based On Functionalized Block Copolymers	3501380000	•							•	•	0	206	236
Linear Scaling of Density Functional Algorithms	3503150000					•				•	277	214	0
Increasing the Chemical Content of Turbulent Flame Models Through the Use of Parallel Computing	3503190000	•			•	•	•				308	291	0
A Configuration Space Toolkit for Automated Spatial Reasoning	3503270000	•							•		224	237	0

FY95 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Coordinating Robotic Motion, Sensing, and Control in Plans and Execution	3503280000	•							•		252	256	160
An Object-Oriented Finite Element Code Architecture for Massively Parallel Computers	3503290000	•	•								367	347	0
Parallel Optimization Methods for Agile Manufacturing	3503310000	•			•	•				•	425	364	426
Massively Parallel Simulation of Grain Boundary Evolution	3503320000	•			•	•	•	•	•		287	317	0
Collective Dynamics of Minimally Cognitive Objects	3503330000	•									129	148	0
A Massively Parallel Finite Element Solution to the Electrocardiographic Inverse Problem	3503340000									•	405	273	0
Self-Repairing Control for Damaged Manipulators	3503350000	•	•						•	•	376	381	368
A Unique Capability - 3-D Electromagnetic Inversion on Massively Parallel Machines	3503360000		•		•	•	•			•	166	197	0
Physical Simulation of Nonisothermal Multiphase Flow in Porous Media	3503370000	•	•						•	•	490	437	486
HyperPrest: A High Performance Multiprocessor Architecture for Real-Time Intelligent Systems	3503380000	•	•								296	331	0
Electronic and Geometric Structure of Transition-Metal Nanoclusters	3503390000	•	•		•	•					268	289	0
Monte Carlo Simulation of Radiation Heat Transfer in Reacting Flows by Massively Parallel Computing	3503410000	•			•	•	•			•	298	316	326
MP System Software Libraries: Making High Performance Practical	3503420000	•	•	•					•	•	0	260	369
A Massively Parallel 2-D Hybrid Continuum-to-Noncontinuum Fluid Code	3503430000	•		•						•	0	301	364
General Techniques for Constrained Motion Planning	3503440000	•	•						•	•	0	357	425
Automated Meshing: A Critical Link in Realizing Large Massively Parallel Adaptive Finite Element Analysis	3503450000	•							•	•	0	220	365
A Multi-Level Code for Metallurgical Effects in Metal-Forming Processes	3503460000	•								•	0	325	382
User Interface Testbed for Technology Packaging	3503470000	•								•	0	263	267
Self-consistent Coupling of Atomistic and Continuum Electrostatics Using Boundary Element Methods	3503490000	•	•		•	•			•		0	192	224
Computation of Chemical Kinetics for Combustion	3503510000	•			•	•	•				0	282	326
Parallel, Object-Oriented Toolkit for Simulation Software	3503520000	•	•			•	•				0	194	223
Virtual Channel Encryption	3503540000	•		•					•	•	0	145	231
Optical Communication for Future High Performance Computers	3503550000	•								•	0	267	285
Time-Dependent Monte Carlo Problems in a Massively Parallel Environment	3503690000	•	•		•	•	•	•	•	•	0	384	414
Advanced Packaging Technology for High Frequency Photonic Applications	3505150000	•		•		•			•	•	397	407	0

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Enhanced Analysis of Complex Gas Mixtures by Pattern Recognition of Microsensor Array Signals	3505180000	•	•	•			•				328	230	0
Monolithically Integrated Active Waveguides and Lasers Using Rare-Earth-Doped Spin-on Glass	3505230000	•							•	•	340	260	0
InP-based Materials for Photonic and Microelectronic Devices	3505260000	•	•			•			•	•	408	404	428
Tunneling Heterostructure Devices for Millimeter Wave Applications	3505280000	•							•	•	371	354	390
Microsensors for In-Process Control and Monitoring during Semiconductor Fabrication	3505290000	•	•	•	•		•			•	314	335	380
Incorporation of Wavelength Selective Devices into Waveguides with Applications	3505310000	•	•							•	311	302	0
Advanced Processes for Synthesis of Optical Amplifier and Waveguide Materials	3505320000	•		•	•					•	308	193	0
Numerical Modeling of Vertical Cavity Semiconductor Lasers	3505330000	•			•						190	177	0
Smart Packaging for Photonics	3505340000	•		•		•			•	•	353	358	335
Microfabricated Combustible Gas Detector	3505350000	•	•		•	•	•		•	•	316	340	401
Integration of Diffractive Optics and VCSEL Arrays for Optical Interconnects	3505360000	•		•					•	•	341	367	404
A Novel Experimental/Numerical Technique for the Mechanical Characterization of Thin Films	3505370000	•			•	•			•	•	219	238	0
Photonic Integrated Circuits for Millimeter Wave Generation	3505380000	•							•	•	364	379	412
Sub-wavelength diffractive optics	3505390000	•		•					•	•	0	429	446
In-Situ Spectral Reflectance for Improved Molecular Beam Epitaxy Device Growth	3505410000	•	•		•	•			•	•	0	369	409
Novel Low-Permittivity Dielectrics for Si-Based Microelectronics	3505420000	•							•		0	382	408
Field Emitter Arrays for Flat Panel Displays	3505430000	•		•	•					•	0	176	0
Double Electron Layer Tunneling Transistor	3505440000	•							•	•	0	347	370
Development of a Process Simulation Capability for the Formation of Titanium Nitride Diffusion Barriers	3505450000	•			•				•	•	0	366	398
A Passive, Self-aligned, Micromachined, Device for Alignment of Arrays of Single-Mode Fibers to Binary Optics for	3505460000	•							•	•	0	232	254
Red to Blue Wavelength Photonic Devices	3505470000	•							•	•	0	455	485
New Low-Voltage Phosphors for Emissive Flat Panel Displays	3505480000	•							•	•	0	230	0
High Speed Modulation of Vertical Cavity Surface Emitting Lasers	3505490000	•		•					•	•	0	392	417
GaAs PIC Development for High Performance Communications	3505510000	•							•	•	0	638	689

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
A General Approach for Analyzing Composite Structures	3507060000	•			•						369	330	0
An Innovative Computational Technique for Multi-Fluid Processing Flows	3507150000	•			•				•	•	336	196	0
Precision Shape Control Using Smart Materials	3507160000	•			•					•	360	353	0
Process-Control of Large-Scale Finite-Element Simulation Software	3507170000	•					•	•		•	231	226	0
The Virtual Test Environment	3507180000	•							•	•	347	374	0
Numerical Simulation of Fracture and Failure Processes in Solid Continua	3507190000	•			•	•		•	•	•	278	389	0
A Gridless Technique for Fluid/Structural Dynamic Coupling on Flexible Membranes	3507210000	•			•				•	•	272	442	0
Health Monitoring of Structures Using Dynamic Analysis	3507220000	•			•		•	•	•	•	447	367	0
Optimization of Computationally Challenging Problems in Engineering Sciences	3507230000	•	•	•	•	•			•	•	0	495	550
Impact & Thermal Shock Response of Metal Cutting Tools for High Strength, High Speed Milling Operations	3507240000	•	•						•		0	338	370
Coherent Structures in Compressible Free-Shear-Layer Flows	3507250000	•		•	•	•	•		•	•	0	385	443
Predicting Weld Solidification Cracking Using Continuum Damage Mechanics	3507260000	•	•			•		•	•	•	0	377	456
Model Reduction Techniques for Non-linear Systems and Control	3507270000	•	•					•	•	•	0	262	375
Repetitively Pulsed Ion Beam System For Surface Treatment	3509020000	•	•		•	•		•		•	442	366	0
Synchronization of Multiple Magnetically Switched Modules to Power Linear Induction Adder Accelerators	3509050000	•	•			•				•	0	397	265
A Feasibility Study of Space-Charge Neutralized Ion Induction Linacs	3509060000	•				•		•		•	0	361	735
A 700 kV, Short Pulse, Repetitive Accelerator for Industrial Applications	3509070000	•	•		•				•	•	0	344	397
Life-cycle Costing for Nuclear Weapons Security	3509080000	•		•					•	•	0	188	205
Impedance Imaging Sensor for Nondestructive Evaluation of Nonmetallic Components	3513160000	•			•					•	302	290	0
Agile Manufacturing of Products Made from Metal Sheet and Plate Using Ultrasonic Screening for Anisotropy	3513180000	•				•				•	334	334	0
Advanced Processing of Printed Wiring Boards	3513190000	•							•	•	370	377	0
Rapid Prototype and Test	3513210000	•							•	•	286	314	0
Computational Model for the Prediction and Optimization of Sintering in Manufacturing Processes	3513220000	•								•	429	449	0
Rapid Prototyping of Composites Using Resin Transfer Molding	3513230000	•		•	•				•	•	323	300	0

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Stereolithography Manufacturing Process Modeling and Optimization	3513240000	•		•	•				•	•	395	478	0
Fabrication of Near Perfect Optics	3513250000	•		•						•	133	284	0
Explosively-Driven Ionized Plasma Jet Generator for Magnetohydrodynamic Precision Strike Technology	3513280000	•							•		339	327	0
Intelligent Tools for On-machine Acceptance of Precision Machined Components	3513320000	•							•	•	0	368	404
Analysis-Driven Mechanical Redesign	3513330000	•							•	•	0	261	265
VIEWS--Virtual Interactive Environment Work Space	3513340000	•							•	•	0	327	376
Liaison Based Assembly Design	3513350000	•							•	•	0	161	145
Intelligent Tool and Process Development for Robotic Edge Finishing	3513360000	•							•	•	0	416	358
Holding Things Fast. Automatic Design of Fixtures and Grasps	3513370000	•	•							•	0	370	293
Active Control of a Grinding Machine using Magnetic Bearings	3513380000	•				•				•	0	424	417
Virtual Prototyping	3513390000	•	•		•				•	•	0	241	356
General Application of Rapid 3-D Digitizing and Tool Path Generation for Complex Shapes	3513410000	•							•	•	0	329	369
Designed Supramolecular Assemblies for Biosensors and Photoactive Devices	3514040000									•	264	266	378
Integrated-Optics Based Ballistic Imaging System for Biomedical Diagnostics	3514050000									•	341	393	0
Decision Trees and Integrated Features for Computer Aided Mammographic Screening	3514070000									•	286	251	357
A New Approach to Protein Function and Structure Prediction	3514080000					•				•	130	207	243
New Miniature Gamma-Ray Camera for Improved Tumor Localization	3514090000	•	•	•				•	•	•	0	332	763
Improved Treatment of Prostate Neoplastic Disease	3514110000	•								•	0	246	239
Development of Sensory Feedback Systems for Minimally Invasive Surgery Applications	3514120000	•									0	389	457
Personal Status Monitor	3514130000	•		•					•	•	0	359	422
Development of a One-Step ELISA Using Microencapsulation Immunoreagents	3514140000	•	•							•	0	275	339
Formation Blocking in Bioremediation	3515080000	•	•								273	221	0
Using a Prehistoric Waste Disposal Site as a Natural Analogue for the Validation of Risk Assessment Ground Water Flow &	3515090000	•	•								292	267	0
Quartz Crystal Microbalance (QCM) Arrays for Solution Analysis	3515110000	•	•		•	•			•	•	366	411	0

FY95 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Radiation-Hardened Robotics (RHobot)	3515130000	•	•			•		•	•	•	337	413	0
Integrated Geophysical Monitoring of Oil Spills and Their Remediation Process	3515140000	•	•			•	•			•	332	193	0
Field-Deployed Optical Remote Sensing for Environmental Monitoring	3515160000	•	•								320	309	0
Development of a Portable X-ray and Gamma-ray Detector Instrument and Imaging Camera for Use in Radioactive and	3515170000	•	•	•				•	•	•	335	290	352
Sensor Fusion and Diagnostic Methods for Characterizing Hazardous Environments	3515180000	•	•	•							379	321	0
Automated Detection and Reporting of Volatile Organic Compounds (VOCs) in Complex Environments	3515190000	•	•							•	598	568	467
Delineating DNAPLs - A Probalistic Approach for Loacting DNAPLs in Subsurface Sediments	3515210000		•			•				•	365	309	461
Reduce Source Term Uncertainty Through Control of Long-term Geochemical Environm	3515220000	•	•								258	249	0
Data and Image Fusion for Geometrical 3-D Cloud Characterization	3515230000	•				•				•	261	334	0
Molecular Dynamics of Gases and Vapors in Nanoporous Solids	3515250000	•	•		•	•	•			•	156	174	0
Compact Environmental Sensing Spectroscopy Using Advanced Semiconductor Light-Emitting Diodes and Lasers	3515260000	•	•	•	•				•		317	327	412
The Development of Ion Mobility Spectroscopy to Analyze Explosives at Environmental Restoration Sites	3515270000	•	•						•	•	0	259	347
Development of Inexpensive Metal Macrocyclic Complexes for Direct Oxidation of Methanol in Fuel Cells	3515290000	•	•		•	•			•	•	0	175	318
Cooperating Robot Arms	3515310000	•	•	•					•	•	0	385	370
Oriented Inorganic Thin Film Channel Structures with Uni-Directional Monosize Microscopes	3515320000	•	•		•	•	•			•	0	353	360
Quantitative Analysis of Trace Contaminants in Aqueous Media	3515330000	•	•				•			•	0	259	264
Replacement of Liquid H2SO4 and HF Acids with Solid Acid Catalysts for Paraffin Alkylation Process	3515340000	•			•		•			•	0	338	381
Organically Enhanced In Situ Electrokinetic Removal of Uranium from Soils	3515350000	•	•							•	0	279	324
Nanoreactors as Novel Catalyst Systems for Waste Stream Remediation	3515360000		•		•	•	•			•	0	276	266
Advanced Materials Development for Multi-Junction Monolithic Photovoltaic Devices	3515380000	•			•	•					362	348	0
New Materials for Energy Conversation in Industrial Chemical Separations	3515390000		•		•						325	302	0
Advanced Tomographic Flow Diagnostics for Opaque Multiphase Fluids	3515410000		•		•	•	•			•	425	365	201
Selective Dehydrogenation over Hydrous Titanium Oxide Supported Catalysts	3515420000		•			•					161	186	0
Evanescent Fiber Optic Sensor for In-situ Monitoring of Chlorinated Organics	3515430000	•	•							•	0	237	283

FY95 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Reapplication of Energetic Materials as Fuels	3515440000	•	•		•		•		•	•	0	273	281
Lossless Waveform and Image Compression	3517070000	•		•					•	•	292	277	0
Supra Gigabit/second (GbA) Computer Communication Technologies	3517090000	•								•	481	421	0
The Quantification of the Surety of an Information System	3517110000	•		•					•	•	436	345	0
Learning Efficient Hypermedia Navigation	3517120000	•								•	390	367	295
An Enabling Architecture for Information Driven Manufacturing	3517130000	•	•		•					•	335	449	484
Network Protocol Toolkit for Enhanced Performance in Distributed and Real Time Computing	3517140000	•			•	•	•			•	385	223	0
Data Zooming - A New Physics for Information Navigation	3517150000									•	0	168	213
Design of a Highly Secure Smartcard	3517160000	•		•						•	0	512	581
Enhanced Internet Firewall Design Using Stateful Filters	3517170000	•		•					•	•	0	146	230
Network based Collaborative Research Environment	3517180000	•	•	•	•				•	•	0	414	386
Protocol Extensions for Asynchronous Transfer Mode Security	3517190000	•		•					•	•	0	386	0
Reliability Assessment of Dynamic Communication Networks	3517210000	•								•	0	228	233
Soil Penetrating Synthetic Aperture Radar	3519140000	•	•	•		•	•		•	•	392	355	0
Multi sensor Data Fusion Algorithm Development	3519150000	•	•	•					•		240	272	0
Electromagnetic Induction Tunnel Detection	3519160000	•	•	•		•	•		•	•	0	359	363
Fiber-Optic Biosensors for Biological Warfare Counter-Proliferation	3519170000	•	•	•		•			•		0	311	353
Moving Mass Trim Control for Precision Strike Warheads	3519180000	•		•					•		0	290	353
Theater Missile Defense Integrated Simulation	3519190000	•		•					•		0	347	299
Unexplored Penetrator Regime Against Super-Hard Underground Facilities	3519210000	•		•					•		0	449	628
Decision Support Aids/Algorithms for RSTAKA	3519260000	•		•					•		237	245	0
Intelligent Information Integration and Fusion	3519270000	•		•					•		175	253	0
Precision Guided Parachute	3519280000	•		•					•		296	408	0
SERAPHIM A New-High-Speed Propulsion Concept	3521110000	•			•		•			•	336	267	0
Fuel Cell Applications for Novel Metalloporphyrin Catalysts	3521120000	•			•	•	•			•	304	297	385

FY95 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Low Speed Aerodynamics of Ground Transportation Systems	3521130000	•	•		•	•	•			•	307	409	0
Public Transportation System Acoustic Analysis	3521140000	•							•	•	284	304	0
Light Weight Hydrides for Hydrogen Vehicular Applications	3521150000	•			•					•	335	308	0
Vehicle Exhaust Gas Chemical Sensors using Acoustic Wave Resonators	3521170000	•	•		•				•	•	0	342	387
High Density Direct Methanol Fuel Cell	3521180000	•			•	•				•	0	194	340
Conceptual Design and Prototyping for a Next-Generation Geographic Information System	3521190000	•	•	•	•				•	•	0	287	423
A Virtual Reality-based Intelligent Training System	3523010000	•		•					•		324	218	0
Development of Magnetic Materials with Irreversible Thermal Behavior and Improved Toughness	3523040000			•					•	•	351	370	0
The Ultimate Heat Spreader, a Silicon Micro-heatpipe Substrate	3523050000	•	•		•	•				•	271	242	0
Haptic Feedback Device for Virtual Reality	3523060000	•	•		•	•	•			•	461	520	0
A New Concept for Very Low-Energy Detonators and Torches	3523090000	•				•			•	•	161	223	0
Superconductive gravity gradiometers for underground target recognition	3523110000	•	•	•			•		•	•	0	418	425
Bandwidth Utilization Maximization for Scientific Radio Frequency Communication	3523120000	•		•					•	•	0	295	357
Extraction of Information from Unstructured Data	3523130000	•		•							0	184	122
Feature Based Methodology for Sensor Fusion	3523140000	•		•					•	•	0	303	356
Nonflammable Deterrent Materials	3523150000	•		•					•	•	0	242	415
Micro Holographic Tagging	3523160000	•		•							0	348	403
Interactive Control of Virtual Actors for Simulation and Training	3523170000	•	•	•						•	0	296	365
Jet Applications of Solder Bumps with Laser Ablation for MCM Packaging	3526010000	•	•		•				•	•	0	306	304
Micromachined Inertial Sensors	3526020000	•		•					•	•	0	296	330
High Reliability Plastic Packaging for Microelectronics	3526030000	•		•					•	•	0	318	388
Ultra-Low Power Microwave CHFET Integrated Circuit Development	3526040000	•		•					•	•	0	412	389
A planar silicon fabrication process for high-aspect-ratio micromachined parts	3526050000	•		•					•	•	0	472	518
Systems Integration of MicroElectroMechanical Devices	3526060000			•					•	•	0	229	0

FY95 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I*	FY94	FY95	FY96
Application Specific Tester-on-a-Resident-CHip (TORCH)	3526070000	•							•	•	0	402	461
Physico-Chemical Stability of Solid Surfaces	3528010000	•				•					0	361	388
Artificial Atoms	3528020000	•				•					0	274	329
Modeling and Characterization of Molecular Structures in Self Assembled and Langmuir Blodgett Films	3528030000		•		•	•					0	86	108
UV Spectroscopic Detection and Identification of Pathogens	3528040000	•	•	•					•	•	0	408	98
Automated Reasoning about Tools for Assembly	3538110000	•								•	0	0	0
Portable Neutron Generator for Quick Detection of Hazardous Materials	3539050000	•	•	•				•		•	273	244	0
Artificial Awareness for Robots - Using Artificial Neural Nets to Detect Unusual	3539120000	•								•	288	71	0
Advanced Electronic Applications of Synthetic Diamond Films	3539130000	•							•		443	390	0
Evolution of Microstructure During Phase Separation	3539150000	•	•					•		•	314	189	0
Nanocavity Effects on Misfit Accomodation in Semiconductors	3539160000	•									270	230	286
Extending the Applicability of Cluster-Based Pattern Recognition with Efficient Approximation Techniques	3539170000	•									255	241	108
Toward Solving the Optical Inverse-Scattering Problem: Using an Ultrashort Pulse and Measuring the Complex Scattered Field	3539180000	•		•		•			•	•	168	151	0
Antipodal Focusing of Shock Energy from Large Asteroid Impacts on Earth	3539190000	•		•		•		•	•	•	119	129	157
Novel Quasi 3-dimensionally Confined Structures	3539210000	•		•		•		•	•	•	215	192	0
Biocavity Laser Microscopy/Spectroscopy of Cells	3539220000	•	•	•	•	•	•		•	•	381	320	371
Prediction of Violent Mechanochemical Processes	3539230000	•		•				•	•	•	388	330	0
An Autonomous microRocket-Powered microElectric-Generator	3539240000		•	•					•	•	0	365	0
Sol-Gel Corrosion	3539250000	•	•								0	358	369
Tailorable, Visible, Room Temperature Light Emission from Si, Ge and Si-Ge Nanoclusters	3539270000	•				•			•	•	0	316	372
A New Paradigm for Near Real-Time Downhole Data Acquisition	3539280000		•		•	•	•		•		0	305	98
In Situ Determination of Composition and Strain During MBE Using Electron Beams	3539320000	•	•	•					•		0	235	318
In Situ Optical Flux Monitoring for Precise Control of Thin Film Deposition	3539330000	•	•		•	•			•	•	0	410	540
Legend Mapping of DOE Program Areas to Codes		A- Defense Programs											

FY95 Significant Support of DOE Program Areas

Legend Mapping of DOE Program Areas to Codes	
	A- Defense Programs
	B- Environmental Management
	C- Non-Proliferations and NS
	D- Energy Efficiency and Renewable Energy
	E- Energy Research
	F- Fossil Energy
	G- Nuclear Energy
	H- Department of Defense (DOD)
	I- Other-Strongly Support SNL Research Foundtions and other DOE PSO's

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Adaptive Scanning Probe Microscopies	3501270000	•			•	•				•	117	379	290
Engineered Monodisperse Porous Materials	3501280000				•						0	282	326
Demonstration of Molecular-Based Transistors	3501290000	•		•	•	•			•	•	0	243	324
Chemical Functional of Oligosilanes Ecommically Attractive Routes to New Photoresponsive Materials	3501310000	•				•				•	0	348	412
PbO-free composites for low temperature packaging	3501320000	•	•			•			•	•	0	249	294
Atomic-Scale Measurement of Liquid Metal Wetting and Flow	3501340000	•	•		•	•					0	358	364
Synthesis and Processing of High Strength SiC Foams A Radically New Approach to Ceramic-Ceramic Composite Materials	3501350000	•			•					•	0	322	379
Carbon Nanotube Composites	3501360000	•			•				•	•	0	315	351
Nanocomposite Materials Based on Hydrocarbon-Bridged Siloxanes	3501370000	•		•	•		•		•	•	0	394	431
New Adhesive Systems Based On Functionalized Block Copolymers	3501380000	•							•	•	0	206	236
Modeling Electrodeposition for Metal Microdevice Fabrication	3501390000	•				•				•	0	0	249
Catalytic Membrane Sensors	3501410000	•	•		•		•			•	0	0	333
Surface-Micromachined Flexural Plate Wave Device Integrated on Silicon	3501420000	•	•							•	0	0	489
Model Determination and Validation for Reactive Wetting Processes	3501430000	•							•	•	0	0	341
Integrated Thin Film Structures for IR Imaging	3501440000	•		•					•		0	0	402
Molecular Imprinting in Aerogels for Remote Sensing of Chemical Weapons and Pesticides	3501450000	•	•	•					•	•	0	0	360
Synthesis and Modeling of Field-Structured Anisotropic Composites	3501460000	•				•					0	0	341
System Studies in Materials	3501470000	•		•							0	0	107
Coordinating Robotic Motion, Sensing, and Control in Plans and Execution	3503280000	•							•		252	256	160
Parallel Optimization Methods for Agile Manufacturing	3503310000	•			•	•				•	425	364	426
Self-Repairing Control for Damaged Manipulators	3503350000	•	•						•	•	376	381	368
Physical Simulation of Nonisothermal Multiphase Flow in Porous Media	3503370000	•	•						•	•	490	437	486
Monte Carlo Simulation of Radiation Heat Transfer in Reacting Flows by Massively Parallel Computing	3503410000	•			•	•	•			•	298	316	326
MP System Software Libraries, Making High Performance Practical	3503420000	•	•	•					•	•	0	260	369

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
A Massively Parallel 2-D Hybrid Continuum-to-Noncontinuum Fluid Code	3503430000	•		•						•	0	301	364
General Techniques for Constrained Motion Planning	3503440000	•	•						•	•	0	357	425
Automated Meshing A Critical Link in Realizing Large Massively Parallel Adaptive Finite Element Analysis	3503450000	•							•	•	0	220	365
A Multi-Level Code for Metallurgical Effects in Metal-Forming Processes	3503460000	•								•	0	325	382
User Interface Testbed for Technology Packaging	3503470000	•								•	0	263	267
Automated Reasoning about Tools for Assembly	3503480000	•								•	0	391	400
Self-consistent Coupling of Atomistic and Continuum Electrostatics Using Boundary Element Methods	3503490000	•	•		•	•			•		0	192	224
Computation of Chemical Kinetics for Combustion	3503510000	•			•	•	•				0	282	326
Parallel, Object-Oriented Toolkit for Simulation Software	3503520000	•	•			•	•				0	194	223
Optical Communication for Future High Performance Computers	3503550000	•								•	0	267	285
Computer-Designed Molecular Memory and Switching Elements	3503570000	•				•				•	0	0	273
Gradient Driven Diffusion of Multi-Atom Molecules Through Macromolecules and Membranes	3503580000	•	•			•	•		•	•	0	0	243
Modeling Complex Turbulent Chemically Reacting Flows on Massively Parallel Supercomputers	3503590000	•	•		•	•	•		•		0	0	422
Quantitative Predictability of Computer Simulations of Complex Systems	3503610000	•	•			•		•	•	•	0	0	127
Density Functional Theory for Classical Fluids at Complex Interfaces	3503620000		•							•	0	0	220
A Massively Parallel Sparse Eigensolver for Structural Dynamics Finite Element	3503630000	•	•	•	•	•			•	•	0	0	149
Automated Geometric Model Builder Using Range Image Sensor Data	3503640000	•									0	0	147
Sensing and Compressing 3D Models	3503650000	•	•	•					•	•	0	0	293
Parallel Quantum Chemistry for Material Aging and Synthesis	3503660000	•	•		•	•	•		•	•	0	0	270
Scalability of Cryptographic Algorithms and Protocols	3503670000	•	•	•		•			•		0	0	330
Development of Time-Dependent Monte Carlo Techniques for Massively Parallel Computers	3503690000	•	•		•	•	•	•	•	•	0	384	414
InP-based Materials for Photonic and Microelectronic Devices	3505260000	•	•			•			•	•	408	404	428
Tunneling Heterostructure Devices for Millimeter Wave Applications	3505280000	•							•	•	371	354	390
Microsensors for In-Process Control and Monitoring during Semiconductor Fabrication	3505290000	•	•	•	•		•			•	314	335	380
Smart Packaging for Photonics	3505340000	•		•		•			•	•	353	358	335

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Microfabricated Combustible Gas Detector	3505350000	•	•		•	•	•		•	•	316	340	401
Integration of Diffractive Optics and VCSEL Arrays for Optical Interconnects	3505360000	•		•					•	•	341	367	404
Photonic Integrated Circuits for Millimeter Wave Generation	3505380000	•							•	•	364	379	412
Sub-wavelength diffractive optics	3505390000	•		•					•	•	0	429	446
In-Situ Spectral Reflectance for Improved Molecular Beam Epitaxy Device Growth	3505410000	•	•		•	•			•	•	0	369	409
Novel Low Permittivity Dielectrics for Si-Based Microelectronics	3505420000	•							•		0	382	408
Double Electron Layer Tunneling Transistor	3505440000	•							•	•	0	347	370
Development of a Process Simulation Capability for the Formation of Titanium Nitride Diffusion Barriers	3505450000	•			•				•	•	0	366	398
A Passive, Self-aligned, Micromachined, Device for Alignment of Arrays of Single-Mode Fibers to Binary Optics for Manufacturable Photonic Packaging	3505460000	•							•	•	0	232	254
Red to Blue Wavelength Photonic Devices	3505470000	•							•	•	0	455	485
High Speed Modulation of Vertical Cavity Surface Emitting Lasers	3505490000	•		•					•	•	0	392	417
GaAs PIC Development for High Performance Communications	3505510000	•							•	•	0	638	689
Wafer Fusion for Integration of Semiconductor Materials and Devices	3505530000	•		•	•	•			•	•	0	0	196
Achromatic Nonlinear Optics for Sensing and Process Control	3505540000	•	•	•	•		•		•	•	0	0	186
Integrated Separation and Optical Detection for Novel On-Chip Chemical Analysis	3505550000	•	•	•					•	•	0	0	344
Integrated Heterojunction Bipolar Transistor Control Electronics and LED/VCSEL Drivers for High-Density Optical Data Links	3505560000	•									0	0	393
Virtual Reactor for the Semiconductor Manufacturing Plant of the Future	3505570000	•							•	•	0	0	329
Selective Oxidation Technology and its Applications Toward Electronic and Optoelectronic Devices	3505580000	•	•	•					•	•	0	0	640
Advanced Concepts for High-Power VCSELs and VCSEL Arrays	3505590000	•		•					•	•	0	0	339
Midwave Infrared (2-6 μm) Emitter-Based Chemical Sensor Systems	3505610000	•	•	•					•	•	0	0	246
Optimization of Computationally Challenging Problems in Engineering Sciences	3507230000	•	•	•	•	•			•	•	0	495	550
Impact & Thermal Shock Response of Metal Cutting Tools for High Strength, High Speed Milling Operations	3507240000	•	•						•		0	338	370
Coherent Structures in Compressible Free-Shear-Layer Flows	3507250000	•		•	•	•	•		•	•	0	385	443

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Predicting Weld Solidification Cracking Using Continuum Damage Mechanics	3507260000	•	•			•		•	•	•	0	377	456
Model Reduction Techniques for Non-linear Systems and Control	3507270000	•	•					•	•	•	0	262	375
Numerical and Experimental Investigation of Vortical Flow-Flame Interaction	3507280000	•	•	•	•	•	•			•	0	0	398
Enhanced Vapor Phase Diffusion in Porous Media	3507290000	•	•								0	0	180
Investigation of Non-equilibrium Microscopic Hydrodynamic Phenomena	3507310000	•		•					•		0	0	316
Constitutive Models of Stress-Strain Behavior of Granular Materials	3507320000	•				•		•			0	0	335
Using Higher Order Gradients to Modeling Localization Phenomena	3507330000	•						•	•		0	0	362
Characterization of fluid transport in microscale structures	3507340000	•	•		•	•			•	•	0	0	296
Scaling Laws for Strength and Toughness of Solid Materials	3507350000	•	•		•	•	•		•	•	0	0	127
Temporal & Spatial Resolution of Fluid Flows	3507360000	•	•	•	•	•	•		•	•	0	0	469
Synchronization of Multiple Magnetically Switched Modules to Power Linear Induction Adder Accelerators	3509050000	•	•			•				•	0	397	265
A Feasibility Study of Space Charge-Neutralized Ion Induction Linacs	3509060000	•				•		•		•	0	361	735
A 700 kV, Short Pulse, Repetitive Accelerator for Industrial Applications	3509070000	•	•		•				•	•	0	344	397
Life-cycle Costing for Nuclear Weapons Security	3509080000	•		•					•	•	0	188	205
High Power Ion Beam (HPIB) Modification of One- and Two-Layer Metal Surfaces	3509090000	•							•	•	0	0	196
Electromagnetic Impulse Radar for Detection of Underground Structures	3509110000	•	•	•					•		0	0	189
Advanced 3D Electromagnetic and Particle-in-Cell Modeling	3509120000	•			•	•			•	•	0	0	205
Intelligent Tools for On-machine Acceptance of Precision Machined Components	3513320000	•							•	•	0	368	404
VIEWS--Virtual Interactive Environment Work Space	3513340000	•							•	•	0	327	376
Intelligent Tool and Process Development for Robotic Edge Finishing	3513360000	•							•	•	0	416	358
Holding Things Fast - Automatic Design of Fixtures and Grasps	3513370000	•	•							•	0	370	293
Active Control of a Grinding Machine using Magnetic Bearings	3513380000	•				•				•	0	424	417
Virtual Prototyping	3513390000	•	•		•				•	•	0	241	356
General Application of Rapid 3-D Digitizing and Tool Path Generation for Complex Shapes	3513410000	•							•	•	0	329	369

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Development of an Immersive Environment to aid in Automatic Mesh Generation	3513420000	•	•		•	•	•		•	•	0	0	267
Ultra-Precise Assembly of Micro-Mechanical Components	3513430000	•		•					•	•	0	0	308
Smart Cutting Tools for Precision Manufacturing	3513440000	•	•		•				•	•	0	0	333
Solid Variant Geometry Modeling	3513450000	•							•	•	0	0	256
Rapid Prototyping/Rapid Manufacturing via Freeform Fabrication of Polymer Matrix Composites	3513460000	•							•	•	0	0	153
Low cost Pd-catalyzed Metallization Technology for Rapid Prototyping of Electronic Substrates/Devices	3513470000	•							•	•	0	0	340
Designed Supramolecular Assemblies for Biosensors and Photoactive Devices	3514040000									•	264	266	378
Decision Trees and Integrated Features for Computer Aided Mammographic Screening	3514070000									•	286	251	357
A New Approach to Protein Function and Structure Prediction	3514080000					•				•	130	207	243
New Miniature Gamma-Ray Camera for Improved Tumor Localization	3514090000	•	•	•				•	•	•	0	332	763
Improved Treatment of Prostate Neoplastic Disease	3514110000	•								•	0	246	239
Development of Sensory Feedback Systems for Minimally Invasive Surgery Applications	3514120000	•									0	389	457
Personal Status Monitor	3514130000	•		•					•	•	0	359	422
Development of a One-Step ELISA Using Microencapsulation Immunoreagents	3514140000	•	•							•	0	275	339
Development of a Portable X-ray and Gamma-ray Detector Instrument and Imaging Camera for Use in Radioactive and Hazardous Material Management	3515170000	•	•	•				•	•	•	335	290	352
Automated Detection and Reporting of Volatile Organic Compounds (VOCs) in Complex Environments	3515190000	•	•							•	598	568	467
Delineating DNAPLs: A Probalistic Approach for Loacting DNAPLs in Subsurface Sediments	3515210000		•			•				•	365	309	461
Compact Environmental Sensing Spectroscopy Using Advanced Semiconductor Light Emitting Diodes and Lasers	3515260000	•	•	•	•				•		317	327	412
The Development of Ion Mobility Spectroscopy to Analyze Explosives at Environmental Restoration Sites	3515270000	•	•						•	•	0	259	347
Development of Inexpensive Metal Macrocyclic Complexes for Direct Oxidation of Methanol in Fuel Cells	3515290000	•	•		•	•			•	•	0	175	318
Cooperating Robot Arms	3515310000	•	•	•					•	•	0	385	370
Oriented Inorganic Thin Film Channel Structures with Uni-Directional Monosize Microscopes	3515320000	•	•		•	•	•			•	0	353	360
Quantitative Analysis of Trace Contaminants in Aqueous Media	3515330000	•	•				•			•	0	259	264

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Replacement of Liquid H2SO4 and HF Acids with Solid Acid Catalysts for Paraffin Alkylation Process	3515340000	•			•		•			•	0	338	331
Organically Enhanced In Situ Electrokinetic Removal of Uranium from Soils	3515350000	•	•							•	0	279	324
Nanoreactors as Novel Catalyst Systems for Waste Stream Remediation	3515360000		•		•	•	•			•	0	276	266
Advanced Tomographic Flow Diagnostics for Opaque Multiphase Fluids	3515410000		•		•	•	•			•	425	365	201
Evanescent Fiber Optic Sensor for In-situ Monitoring of Chlorinated Organics	3515430000	•	•							•	0	237	283
Reapplication of Energetic Materials as Fuels	3515440000	•	•		•		•		•	•	0	273	281
Designed Molecular Recognition Materials for Chiral Sensors, Separations and Catalytic Materials	3515450000	•									0	0	301
Learning Efficient Hypermedia Navigation	3517120000	•								•	390	367	295
Data Zooming - A New Physics for Information Navigation	3517150000									•	0	168	213
Design of a Highly Secure Smartcard	3517160000	•		•						•	0	512	581
Enhanced Internet Firewall Design Using Stateful Filters	3517170000	•		•					•	•	0	146	230
Network-based Collaborative Research Environment	3517180000	•	•	•	•				•	•	0	414	386
Reliability Assessment of Dynamic Communication Networks	3517210000	•								•	0	228	233
Object-Oriented Parallel Discrete Event Simulation System--An Enabling Foundation for Rapid Development of High-Performance Large-Scale Simulations	3517220000	•				•		•	•	•	0	0	240
Agent-Based Remediation of the Mosaic Classification Problem	3517230000	•		•				•	•	•	0	0	237
Biometric Identity Verification for Remote User Authentication and Access Control Applications	3517240000	•		•						•	0	0	468
Development of an Intelligent Geographic Information System	3517250000				•	•	•	•		•	0	0	244
Use-Control of "Robustness-Agile" Encryption Devices	3517260000	•		•					•	•	0	0	316
Virtual Channel Encryption	3517270000	•		•					•	•	0	145	231
Electromagnetic Induction Tunnel Detection	3519160000	•	•	•		•	•		•	•	0	359	363
Fiber-Optic Biosensors for Biological Warfare Counter-Proliferation	3519170000	•	•	•		•			•		0	311	353
Moving Mass Trim Control for Precision Strike Warheads	3519180000	•		•					•		0	290	353
Theater Missile Defense Integrated Simulation	3519190000	•		•					•		0	347	299
Unexplored Penetrator Regime Against Super-Hard Underground Facilities	3519210000	•		•					•		0	479	628
Fuel Cell Applications for Novel Metalloporphyrin Catalysts	3521120000	•			•	•	•			•	304	297	385

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Vehicle Exhaust Gas Chemical Sensors using Acoustic Wave Resonators	3521170000	•	•		•				•	•	0	342	387
High Density Direct Methanol Fuel Cell	3521180000	•			•	•				•	0	194	340
Conceptual Design and Prototyping for a Next-Generation Geographic Information System	3521190000	•	•	•	•				•	•	0	287	423
Hydrogen Production for Fuel Cells by Selective Dehydrogenation of Alkanes in Catalytic Membrane Reactors	3521210000	•	•		•	•	•		•	•	0	0	196
Hybrid Vehicle Engine Development	3521220000	•			•						0	0	81
Development of Innovative Combustion Processes for a Direct-Injection Diesel Engine	3521230000				•	•					0	0	196
Superconductive gravity gradiometers for underground target recognition	3523110000	•	•	•			•		•	•	0	418	425
Bandwidth Utilization Maximization for Scientific Radio Frequency Communication	3523120000	•		•					•	•	0	295	357
Extraction of Information from Unstructured Data	3523130000	•		•							0	184	122
Feature Based Methodology for Sensor Fusion	3523140000	•		•					•	•	0	303	356
Nonflammable Deterrent Materials	3523150000	•		•					•	•	0	242	415
Micro Holographic Tagging	3523160000	•		•							0	348	403
Interactive Control of Virtual Actors for Simulation and Training	3523170000	•	•	•						•	0	296	365
Jet Applications of Solder Bumps with Laser Ablation for MCM Packaging	3526010000	•	•		•				•	•	0	306	304
Micromachined Inertial Sensors (Accelerometer, Gyroscope)	3526020000	•		•					•	•	0	296	330
High Reliability Plastic Packaging for Microelectronics	3526030000	•		•					•	•	0	318	388
Ultra-Low Power Microwave CHFET Integrated Circuit Development	3526040000	•		•					•	•	0	412	389
A planar silicon fabrication process for high-aspect-ratio micromachined parts	3526050000	•		•					•	•	0	472	518
Application Specific Tester-on-a-Resident-CHip (TORCH)	3526070000	•							•	•	0	402	461
Microelectronic Biosensors	3526080000	•	•	•					•	•	0	0	342
Validation of the MDL ASIC Prototyping Process	3526090000	•		•					•		0	0	292
High-G Accelerometer for Earth-Penetrator Weapons Applications	3526110000	•							•	•	0	0	359
Agile Prototyping of Microelectromechanical Systems (MEMS)	3526120000	•	•	•					•	•	0	0	403
Highly Parallel, Low-Power, Photonic Interconnects for Inter-Board Signal Distribution	3526130000	•									0	0	405
Experimental Replication of the Reifenschweiler Effect	3536010000	•									0	0	51

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Molecular Concentrator	3536020000	•									0	0	153
Investigation of Concepts for Storage and Releasing Energy from Nuclear Isomers	3536030000	•									0	0	50
Distributed Object and Intelligent Agent Technologies in a Wide Area Network Testbed	3538010000	•		•						•	0	0	246
Laser Spray Fabrication for Net-Shape Rapid Product Realization	3538020000	•			•					•	0	0	317
Solid Model Design Simplification	3538030000	•							•	•	0	0	207
Process Optimization for Electron Beam Joining of Ceramic and Glass Components	3538040000	•			•					•	0	0	296
Self Tuning Process Monitoring System for Process Based Product Validation	3538050000	•							•	•	0	0	135
Solution Synthesis and Processing of PZT Materials for Neutron Generator Applications	3538060000	•									0	0	360
Effect of Composition and Processing Conditions on the Reliability of Cermet/Alumina Components	3538070000	•							•	•	0	0	292
Carbon Coatings for Improved Spyiron Tube Performance and Reliability	3538080000	•		•						•	0	0	276
A Multi-Level Code for Metallurgical Effects in Metal-Forming Processes	3538090000	•								•	0	325	382
Automated Reasoning about Tools for Assembly	3538110000	•								•	0	391	400
Analysis-Driven Mechanical Redesign	3538120000	•							•	•	0	261	265
Liaison Based Assembly Design	3538130000	•							•	•	0	161	145
An Enabling Architecture for Information Driven Manufacturing	3538140000	•	•		•					•	335	449	484
Nanocavity Effects on Misfit Accomodation in Semiconductors	3539160000	•									270	230	286
Extending the Applicability of Cluster-Based Pattern Recognition with Efficient Approximation Techniques	3539170000	•									255	241	108
Antipodal Focusing of Shock Energy from Large Asteroid Impacts on Earth	3539190000										119	129	157
Biocavity Laser Microscopy/Spectroscopy of Cells	3539220000										381	320	371
Sol-Gel Preservation of Mankind's Cultural Heritage in Objects Constructed of Stone	3539250000	•	•								0	358	369
Tailorable, Visible, Room Temperature Light Emission from Si, Ge and Si-Ge Nanoclusters	3539270000									•	0	316	372
A New Paradigm for Near Real-Time Downhole Data Acquisition	3539280000		•		•	•	•		•		0	305	98
In Situ Determination of Composition and Strain During MBE Using Electron Beams	3539320000	•	•	•					•		0	235	318
In Situ Optical Flux Monitoring for Precise Control of Thin Film Deposition	3539330000	•	•		•	•			•	•	0	410	540

SNL LDRD FY96 Significant Support of DOE Program Areas

Title	Case Number	A	B	C	D	E	F	G	H	I	FY94	FY95	FY96
Understanding and Control of Energy Transfer Mechanisms in Optical CeramicMS	3539340000	•		•					•	•	0	0	389
Molecular-Scale Lubricants for Micromachine Applications	3539350000	•	•			•					0	0	394
Ultra-hard Multilayer Coatings	3539360000	•							•	•	0	0	116
Smart Interface Bonding Alloys (SIBA): Tailoring Thin Film Mechanical Properties	3539370000	•				•			•		0	0	424
Scanning Probe-based Processes for Nanometer-scale Device Fabrication	3539380000	•				•					0	0	446
Wide-Bandgap Compound Semiconductors to Enable Novel Semiconductor Devices	3539390000	•	•	•					•	•	0	0	252
Recognizing Atoms in Atomically-engineered Nanostructures: an Interdisciplinary Approach	3539410000	•							•	•	0	0	392
Photonic Band Gap Structures as a Gateway to Nano-Photonics	3539420000	•		•					•	•	0	0	241
Physico-Chemical Stability of Solid Surfaces	3539430000	•				•					0	361	388
Artificial Atoms	3539440000	•				•					0	274	329
Modeling and Characterization of Molecular Structures in Self Assembled and Langmuir-Blodgett Films	3539450000		•		•	•					0	86	108
UV Spectroscopic Detection and Identification of Pathogens	3539460000	•	•	•					•	•	0	408	98

Legend Mapping of DOE Program Areas to Codes	
	A- Defense Programs
	B- Environmental Management
	C- Non-Proliferationa and NS
	D- Energy Efficiency and Renewable Energy
	E- Energy Research
	F- Fossil Energy
	G- Nuclear Energy
	H- Department of Defense (DOD)
	I- Other-Strongly Support SNL Research Foundtions and other DOE PSO's

Mr. Myers. Please identify by type and amount of material, all sales of assets which were conducted in fiscal years 1995, 1996 and proposed for 1997?

Secretary O'Leary. There were no sales under the Department's Asset Sales Initiative in fiscal year 1995. While the initiative was announced on May 5, 1995, the first sale did not take place until November, 1995. The Asset Sales Initiative involves sales whose gross revenues are, or are expected to be, in excess of $100,000. The Department's routine disposition of assorted used equipment and scrap materials will continue as before, with numerous (in some cases, weekly) small sales at our various facilities. Annual revenue from these routine sales have historically been in the range of $5 to $7 million.

In fiscal year 1996, we have executed the aforementioned November sale of approximately 98,000 troy ounces of precious metals receiving $3.1 million. A second precious metals sale is scheduled for this June, with proceeds estimated to be $5 million. We are also planning to sell this year (figures in parentheses are estimated approximate receipts): an 80 ton stainless steel pump (over $100,000); gas turbine generators ($180,000); 212 metric tons of natural Uranium ($1.1 million); a facility at Oxnard, California ($5.0 million); and several large parcels of scrap metal ($3.0 million).

We are now planning our fiscal year 1997 asset sales.

Mr. Myers. What was the administrative cost of conducting each sale, what was the original cost of the asset, what was the current book value of the asset, and what was the revenue received from the sale of that asset?

Secretary O'Leary. The administrative costs of our routine sales of used equipment and scrap are imbedded in the overall cost of operating our plant infrastructure. Under the Asset Sales Initiative, we will be capturing the costs directly involved in the sale, specifically those incurred in preparing the asset for sale (e.g., packaging, dismantling, radiological screening, and transportation), selling expenses (e.g., auctioneer fees), and if appropriate, administrative expenses (e.g., charges for legal support in connection with complex contracts).

We are currently developing the necessary accounting infrastructure to capture the sales and cost of sale information required by the Asset Sales Initiative. In an ongoing effort parallel to this work, the Personal Property Disposition Process Re-engineering Team is examining how best to categorize the costs of selling and otherwise disposing of property. When the accounting guidance is issued, we will be able to determine the original and book value of the November precious metals sale and any future sale, as well.

ASSET SALES

Mr. Myers. Have revenues from all sales of DOE assets been returned to Treasury? If not, please describe which revenues were retained by the Department and what authority allowed the revenues to be retained?

Secretary O'Leary. Revenue from DOE assets sold by federal personnel is returned to the Treasury in accordance with the requirements of the Federal Property and Administrative Services Act of 1954 (recodified as 40 U.S.C., Section 485). Except for revenue received from the sale of timber at Savannah River, which is budgeted for in the Departmental Administration Appropriation, revenue from sales of DOE assets sold by DOE's cost-type contractors in the normal course of operations is used as an offset to allowable costs under the contracts in accordance with 40 U.S.C. 485(e) and applicable provisions contained in the contracts.

FERC EXCESS RECEIPTS

Mr. Myers. The Department's budget for fiscal year 1997 shows excess receipts from the Federal Energy Regulatory Commission offsetting total costs for the Department. Please describe what authority is needed for the Department of Energy to retain excess Federal Energy Regulatory Commission receipts which have traditionally been returned to Treasury.

Secretary O'Leary. The Department does not propose to retain excess receipts. The budget still proposes that these excess receipts be returned to Treasury, as they have been in the past. The change, which began with the FY 1996 budget is that these excess receipts are shown with the Federal Energy Regulatory Commission account to provide a more complete picture of Federal Energy Regulatory Commission activities. The Federal Energy Regulatory Commission sets its fees to recover the full government costs of services and these include more than just Federal Energy Regulatory Commission costs. The part of the receipts which corresponds to the direct Federal Energy Regulatory Commission costs is used as an offset to the Federal Energy Regulatory Commission account. Those receipts for costs associated with other Federal agencies are returned to Treasury.

Mr. Myers: For each DOE headquarters organization not funded by the Departmental Administration account, identify the number of employees performing the following functions budget and finance, personnel management and employee training, procurement and contract management, computer, telecommunication, and information systems, congressional and intergovernmental affairs, public affairs; policy; legal services; minority economic impacts and diversity, and quality management.

Secretary O'Leary: We would like to provide the following table for the record

	Defense Programs	Nonprolif. & National Security	Fissile Materials Disposition	Worker & Community Transition	Environmental Restoration	Environmental Safety & Health	Civilian Rad. Waste Management	Energy Research	Total
Budget & Finance	23	7 5	1 5	0.31	33	5	5	8	83 31
Personnel Management & Employee Training	12	4 65		0 05	32	11	6		65 7
Procurement & Contract Mang.	2	1 15		0 04	14	3	11	10	41 19
Computer, Telecommunications and Information Systems	9	3		0 25	16	[illegible]	7	4	48 25
Cong. & Intergovernmental Affairs	3	1		0 25	10	0 5	0		14 75
Public Affairs	0			0 25	9	0 5	0	1	10 75
Policy	2	0		0 25	5	0	3		10 25
Legal Services	0	0		0 25	0	[illegible]	1		1 25
Minority Economic Impacts and Diversity	2	0		0 25	3		1		[illegible] 6 25
Quality Management	2	1 25			1	1	[illegible]		8 25
Sub-total	55	18 55	1 5	1 9	123	30	37	15	281.95

	Nuclear Energy	Energy Efficiency	Fossil Energy	Energy Information Administration	Inspector General	Field Mgmt	Hearings & Appeals	Total
Budget & Finance	7	8	10	6	1	1.5	1 2	34.7
Personnel Management & Employee Training	4	3	2	2	7	1	0 7	19.7
Procurement & Contract Mang.	1	1	4	6		0 7	0 1	12.8
Computer, Telecommunications and Information Systems	2	3	3	13	4	0 5	1 2	0 26 7
Cong. & Intergovernmental Affairs	1 5		1	0		0 3		2.8
Public Affairs	0		3	0		0	0 2	3 2
Policy	1	1	1	0		0	0	3
Legal Services			0		3	0		3
Minority Economic Impacts and Diversity	0 2		1	1		1	0 9	0 4.1
Quality Management	0 3		0	1		0.7	0 7	
Sub-total	17	16	25	29	15	5 7	5	112.7
Total								394.65

Clarification of Hearing And Appeals (OHA) numbers
The OHA is a legal office and all its activities can be considered to be providing legal services,broadly defined Thus, all 62 FTEs currently on board could be considered as providing legal services Alternatively, you could subtract 5 FTEs listed above as providing other support services to get 57 FTEs If the term legal services is defined more narrowly to mean providing services to other departmental elements, such as such as security clearance, whistleblower, and Freedom of Information Cases (generally excluding refund cases) the number of FTEs would be about 23 FTEs

Clarification of Environmental Management numbers:
Congressional and Intergovernmental Affairs represents all EM employees working with state and tribal governments.

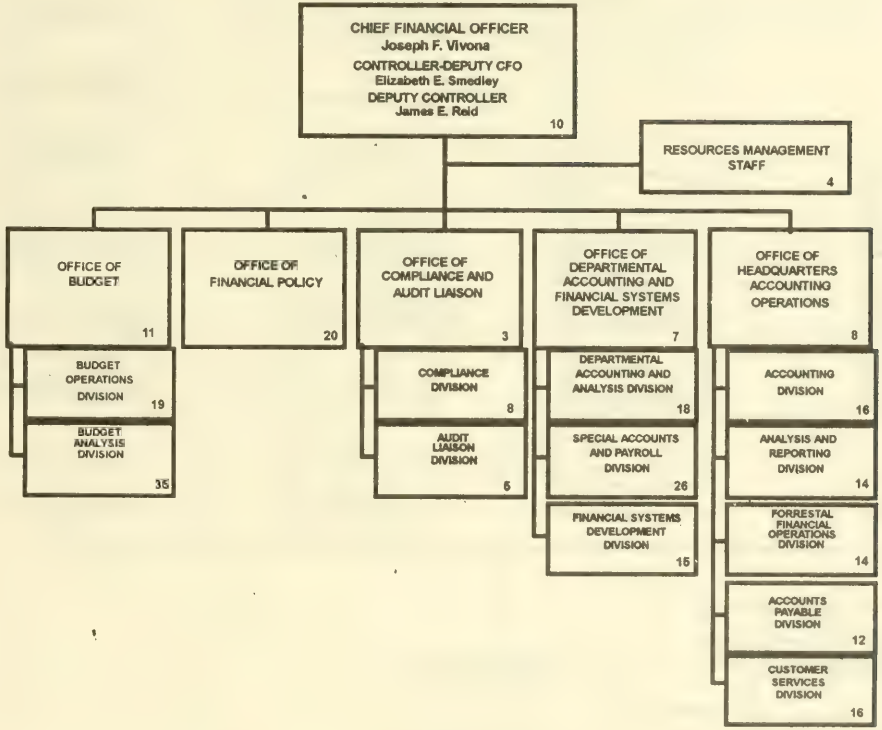
Public Affairs represents all EM employees working in stakeholder advocacy

ORGANIZATION CHARTS

Mr. Myers. For each organization in headquarters, please provide a detailed organization chart showing the number of FTEs in each block.

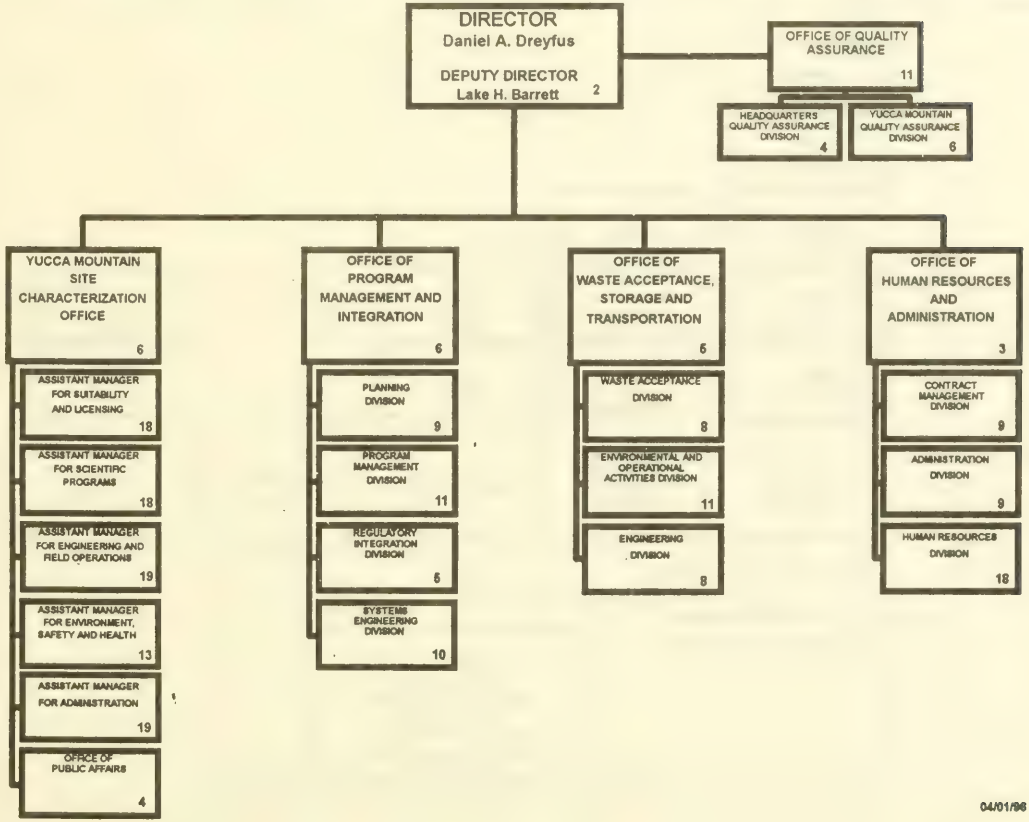
Secretary O'Leary. I would like to insert the following charts into the record, which show the employment levels as of March 28, 1996. (The information follows:)

OFFICE OF CHIEF FINANCIAL OFFICER

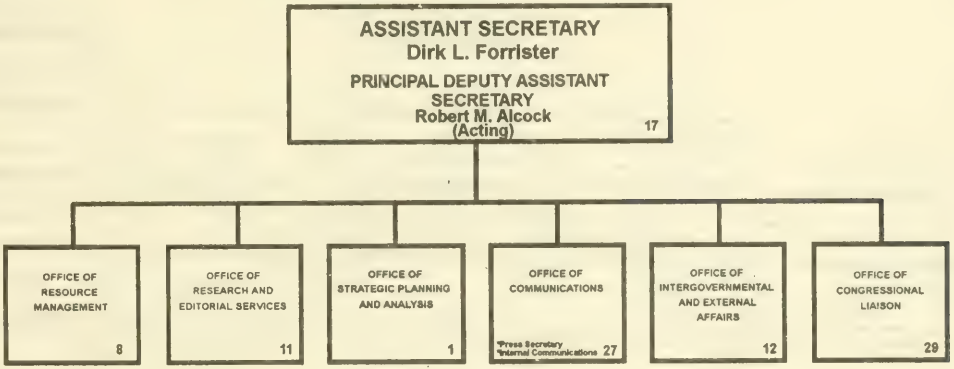


04/01/96

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT


DIRECTOR
Daniel A. Dreyfus
DEPUTY DIRECTOR
Lake H. Barrett 2
OFFICE OF QUALITY ASSURANCE 11
HEADQUARTERS QUALITY ASSURANCE DIVISION 4
YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION 6
YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE 6
ASSISTANT MANAGER FOR SUITABILITY AND LICENSING 18
ASSISTANT MANAGER FOR SCIENTIFIC PROGRAMS 18
ASSISTANT MANAGER FOR ENGINEERING AND FIELD OPERATIONS 19
ASSISTANT MANAGER FOR ENVIRONMENT, SAFETY AND HEALTH 13
ASSISTANT MANAGER FOR ADMINISTRATION 19
OFFICE OF PUBLIC AFFAIRS 4
OFFICE OF PROGRAM MANAGEMENT AND INTEGRATION 6
PLANNING DIVISION 9
PROGRAM MANAGEMENT DIVISION 11
REGULATORY INTEGRATION DIVISION 6
SYSTEMS ENGINEERING DIVISION 10
OFFICE OF WASTE ACCEPTANCE, STORAGE AND TRANSPORTATION 6
WASTE ACCEPTANCE DIVISION 8
ENVIRONMENTAL AND OPERATIONAL ACTIVITIES DIVISION 11
ENGINEERING DIVISION 8
OFFICE OF HUMAN RESOURCES AND ADMINISTRATION 3
CONTRACT MANAGEMENT DIVISION 9
ADMINISTRATION DIVISION 9
HUMAN RESOURCES DIVISION 18
04/01/96

ASSISTANT SECRETARY FOR CONGRESSIONAL, PUBLIC AND INTERGOVERNMENTAL AFFAIRS



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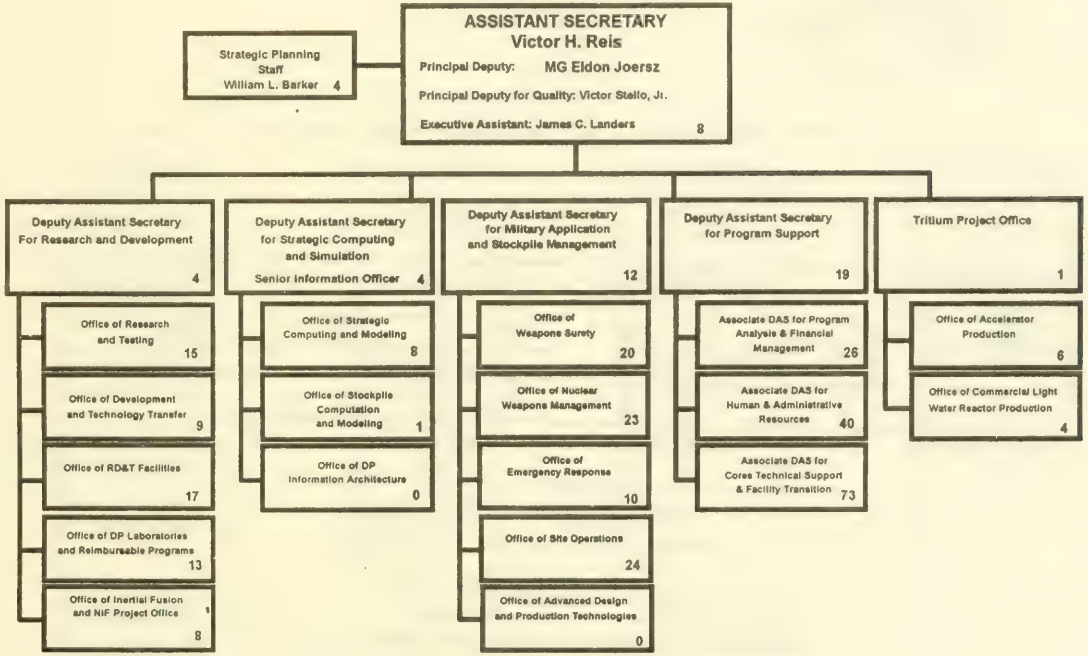
ASSISTANT SECRETARY FOR DEFENSE PROGRAMS


ASSISTANT SECRETARY
Victor H. Reis
Principal Deputy: MG Eldon Joersz
Principal Deputy for Quality: Victor Stello, Jr.
Executive Assistant: James C. Landers 8
Strategic Planning Staff
William L. Barker 4
Deputy Assistant Secretary For Research and Development 4
Office of Research and Testing 15
Office of Development and Technology Transfer 9
Office of RD&T Facilities 17
Office of DP Laboratories and Reimbursable Programs 13
Office of Inertial Fusion and NIF Project Office 8
Deputy Assistant Secretary for Strategic Computing and Simulation
Senior Information Officer 4
Office of Strategic Computing and Modeling 8
Office of Stockpile Computation and Modeling 1
Office of DP Information Architecture 0
Deputy Assistant Secretary for Military Application and Stockpile Management 12
Office of Weapons Survety 20
Office of Nuclear Weapons Management 23
Office of Emergency Response 10
Office of Site Operations 24
Office of Advanced Design and Production Technologies 0
Deputy Assistant Secretary for Program Support 19
Associate DAS for Program Analysis & Financial Management 26
Associate DAS for Human & Administrative Resources 40
Associate DAS for Cores Technical Support & Facility Transition 73
Tritium Project Office 1
Office of Accelerator Production 6
Office of Commercial Light Water Reactor Production 4

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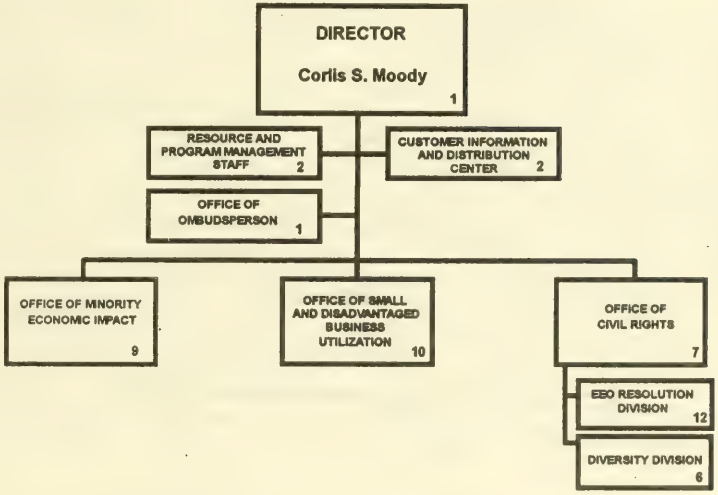
OFFICE OF ECONOMIC IMPACT AND DIVERSITY


DIRECTOR
Corlis S. Moody
1
RESOURCE AND PROGRAM MANAGEMENT STAFF 2
CUSTOMER INFORMATION AND DISTRIBUTION CENTER 2
OFFICE OF OMBUDSPERSON 1
OFFICE OF MINORITY ECONOMIC IMPACT 9
OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION 10
OFFICE OF CIVIL RIGHTS 7
EEO RESOLUTION DIVISION 12
DIVERSITY DIVISION 6

04/01/96

OFFICE OF THE SECRETARY OF ENERGY ADVISORY BOARD

DIRECTOR

David Chaney
(Acting)

5

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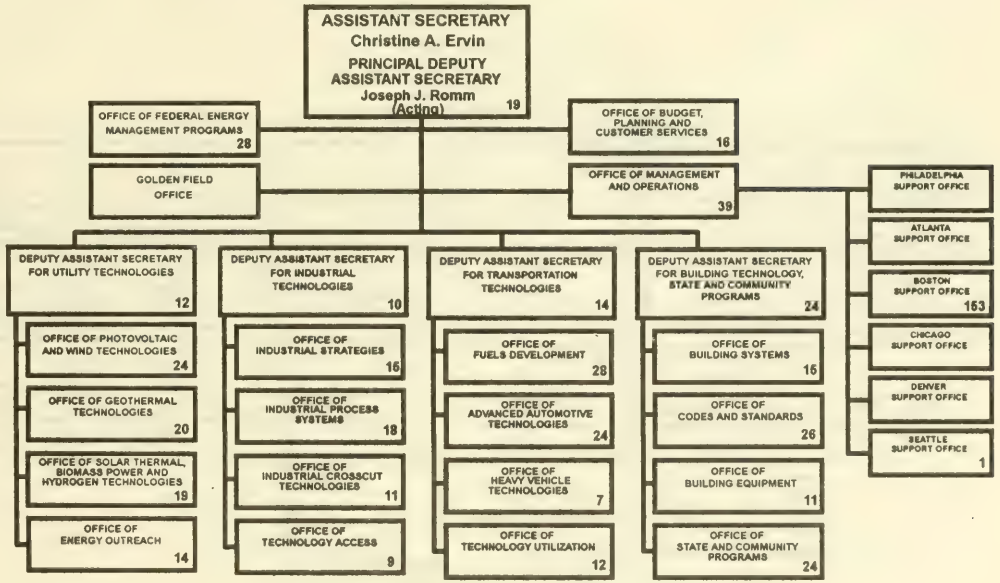
ASSISTANT SECRETARY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY



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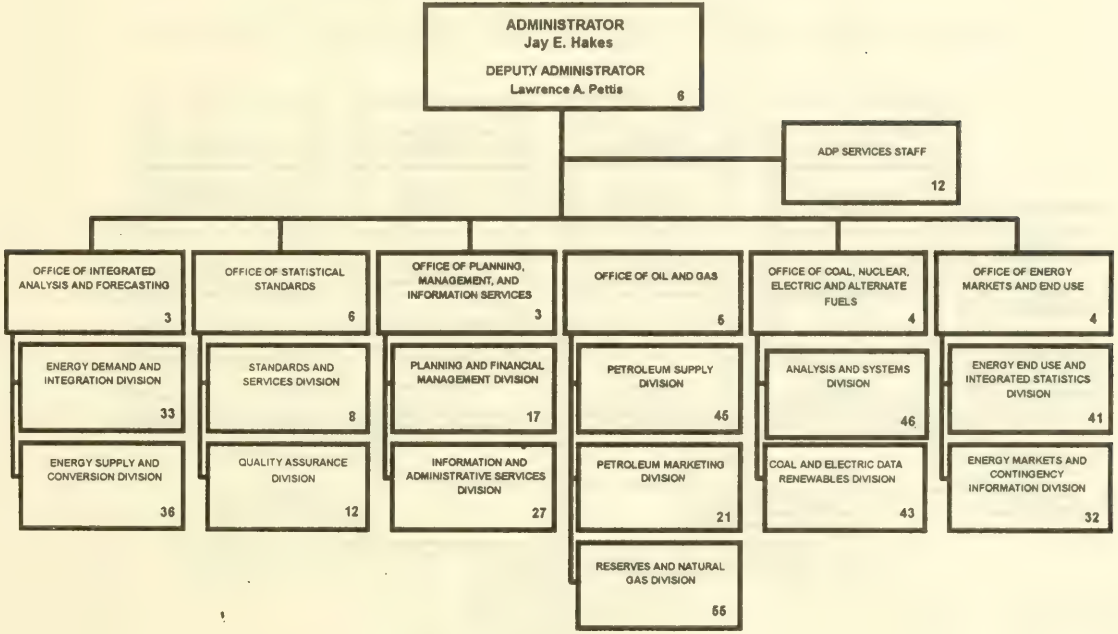
ENERGY INFORMATION ADMINISTRATION



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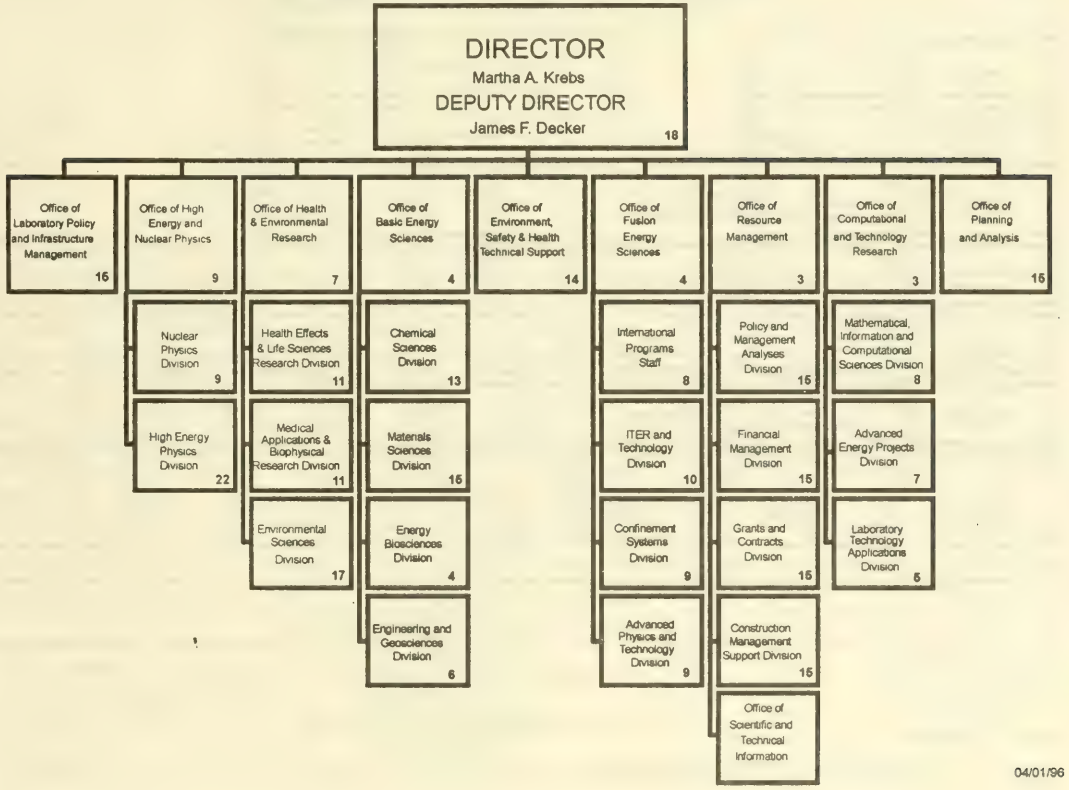
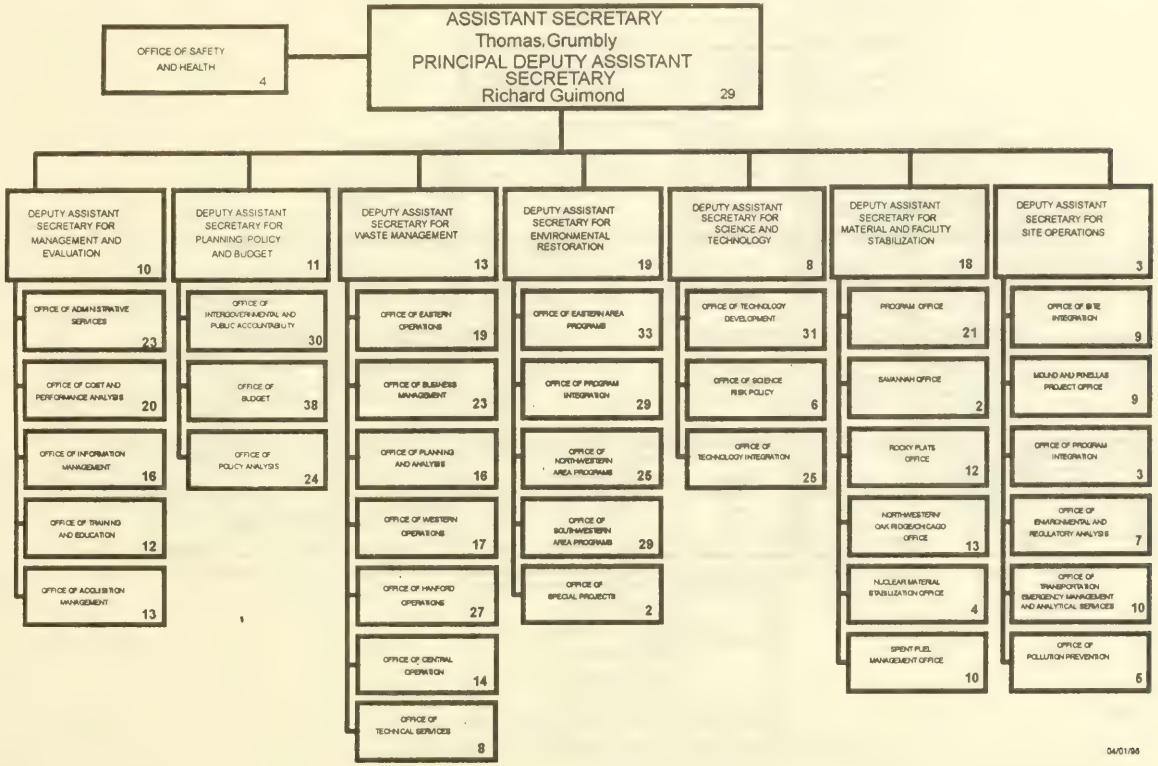
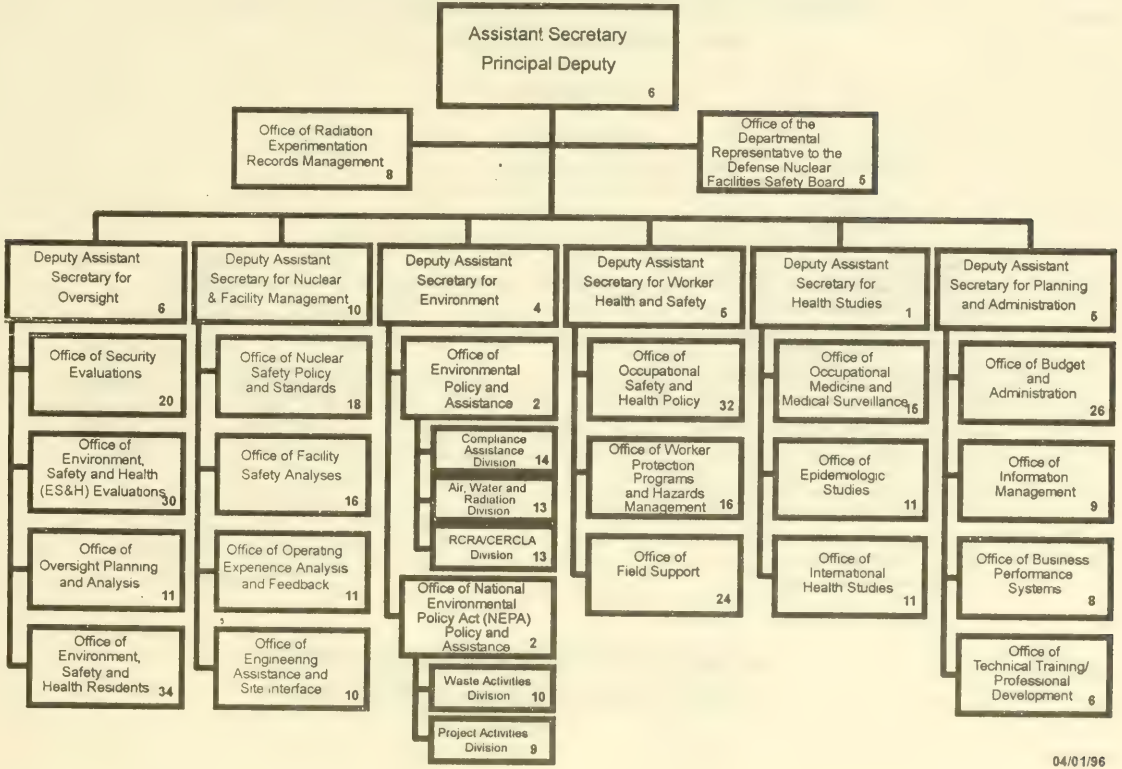
OFFICE OF ENERGY RESEARCH



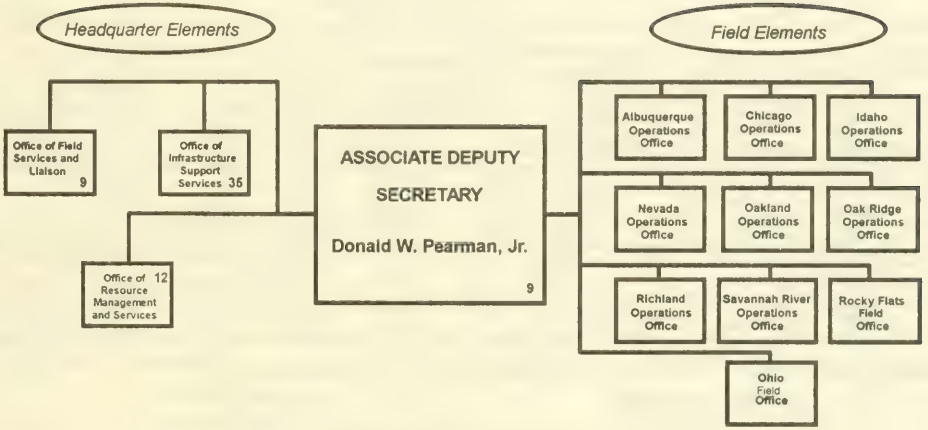
ASSISTANT SECRETARY FOR ENVIRONMENTAL MANAGEMENT



Assistant Secretary for Environment, Safety and Health



OFFICE OF THE ASSOCIATE DEPUTY SECRETARY FOR FIELD MANAGEMENT



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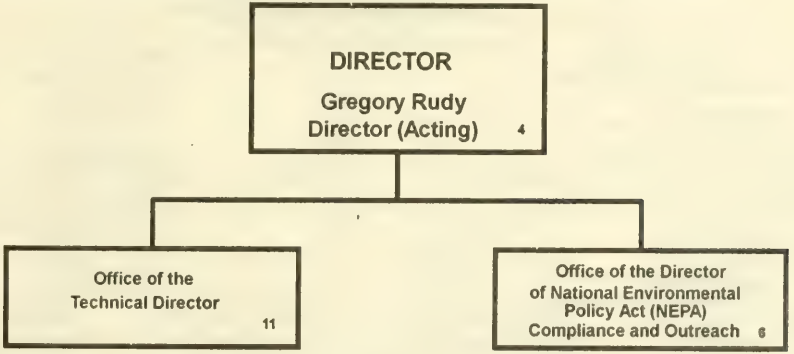
OFFICE OF FISSILE MATERIALS DISPOSITION



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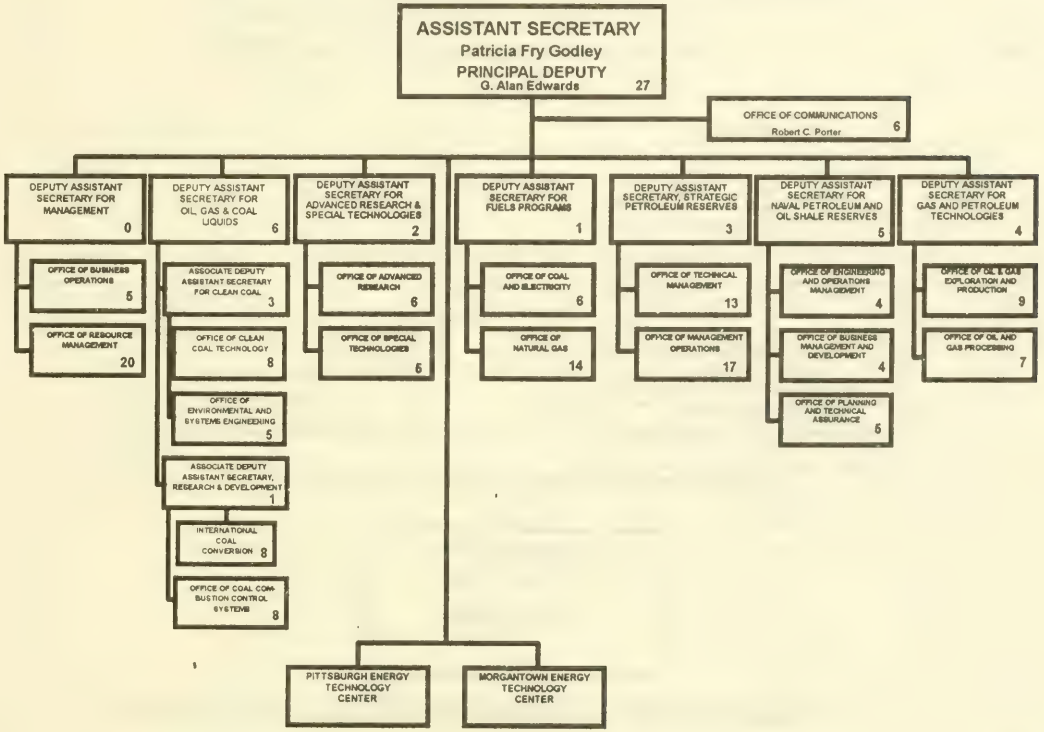
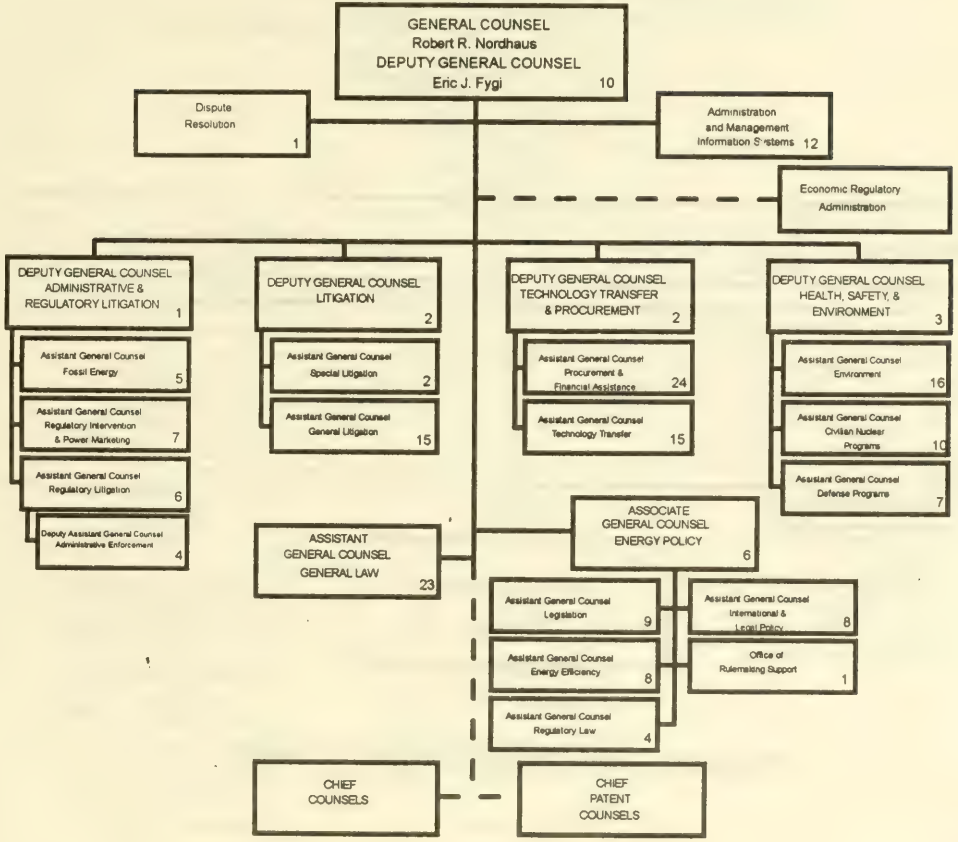
ASSISTANT SECRETARY FOR FOSSIL ENERGY


ASSISTANT SECRETARY
Patricia Fry Godley
PRINCIPAL DEPUTY
G. Alan Edwards 27
OFFICE OF COMMUNICATIONS
Robert C. Porter 6
DEPUTY ASSISTANT SECRETARY FOR MANAGEMENT 0
OFFICE OF BUSINESS OPERATIONS 5
OFFICE OF RESOURCE MANAGEMENT 20
DEPUTY ASSISTANT SECRETARY FOR OIL, GAS & COAL LIQUIDS 6
ASSOCIATE DEPUTY ASSISTANT SECRETARY FOR CLEAN COAL 3
OFFICE OF CLEAN COAL TECHNOLOGY 8
OFFICE OF ENVIRONMENTAL AND SYSTEMS ENGINEERING 5
ASSOCIATE DEPUTY ASSISTANT SECRETARY, RESEARCH & DEVELOPMENT 1
INTERNATIONAL COAL CONVERSION 8
OFFICE OF COAL COMBUSTION CONTROL SYSTEMS 8
DEPUTY ASSISTANT SECRETARY FOR ADVANCED RESEARCH & SPECIAL TECHNOLOGIES 2
OFFICE OF ADVANCED RESEARCH 6
OFFICE OF SPECIAL TECHNOLOGIES 6
DEPUTY ASSISTANT SECRETARY FOR FUELS PROGRAMS 1
OFFICE OF COAL AND ELECTRICITY 6
OFFICE OF NATURAL GAS 14
DEPUTY ASSISTANT SECRETARY, STRATEGIC PETROLEUM RESERVES 3
OFFICE OF TECHNICAL MANAGEMENT 13
OFFICE OF MANAGEMENT OPERATIONS 17
DEPUTY ASSISTANT SECRETARY FOR NAVAL PETROLEUM AND OIL SHALE RESERVES 5
OFFICE OF ENGINEERING AND OPERATIONS MANAGEMENT 4
OFFICE OF BUSINESS MANAGEMENT AND DEVELOPMENT 4
OFFICE OF PLANNING AND TECHNICAL ASSURANCE 6
DEPUTY ASSISTANT SECRETARY FOR GAS AND PETROLEUM TECHNOLOGIES 4
OFFICE OF OIL & GAS EXPLORATION AND PRODUCTION 9
OFFICE OF OIL AND GAS PROCESSING 7
PITTSBURGH ENERGY TECHNOLOGY CENTER
MORGANTOWN ENERGY TECHNOLOGY CENTER

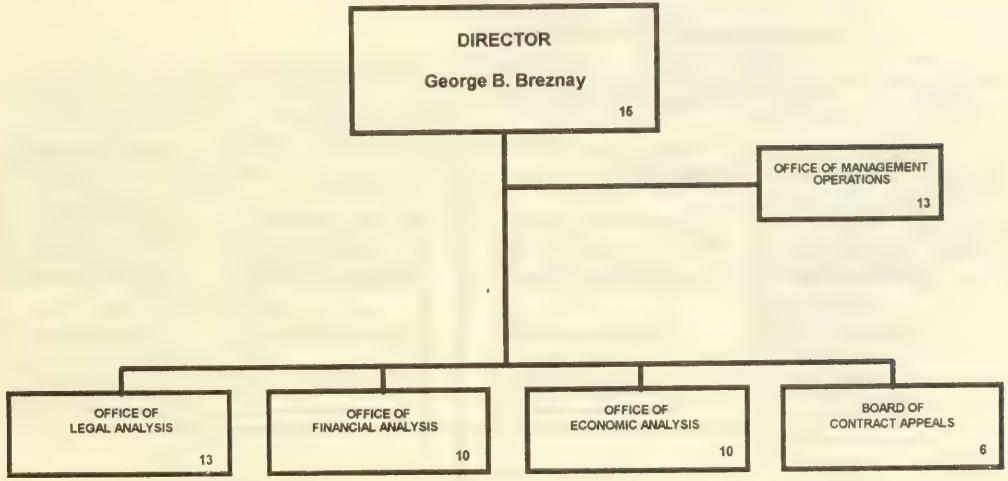
04/01/96

OFFICE OF GENERAL COUNSEL


GENERAL COUNSEL
Robert R. Nordhaus
DEPUTY GENERAL COUNSEL
Eric J. Fygi 10
Dispute Resolution 1
Administration and Management Information Systems 12
Economic Regulatory Administration
DEPUTY GENERAL COUNSEL ADMINISTRATIVE & REGULATORY LITIGATION 1
Assistant General Counsel Fossil Energy 5
Assistant General Counsel Regulatory Intervention & Power Marketing 7
Assistant General Counsel Regulatory Litigation 6
Deputy Assistant General Counsel Administrative Enforcement 4
DEPUTY GENERAL COUNSEL LITIGATION 2
Assistant General Counsel Special Litigation 2
Assistant General Counsel General Litigation 15
DEPUTY GENERAL COUNSEL TECHNOLOGY TRANSFER & PROCUREMENT 2
Assistant General Counsel Procurement & Financial Assistance 24
Assistant General Counsel Technology Transfer 15
DEPUTY GENERAL COUNSEL HEALTH, SAFETY, & ENVIRONMENT 3
Assistant General Counsel Environment 16
Assistant General Counsel Civilian Nuclear Programs 10
Assistant General Counsel Defense Programs 7
ASSISTANT GENERAL COUNSEL GENERAL LAW 23
ASSOCIATE GENERAL COUNSEL ENERGY POLICY 6
Assistant General Counsel Legislation 9
Assistant General Counsel International & Legal Policy 8
Assistant General Counsel Energy Efficiency 8
Office of Rulemaking Support 1
Assistant General Counsel Regulatory Law 4
CHIEF COUNSELS
CHIEF PATENT COUNSELS

04/01/96

OFFICE OF HEARINGS AND APPEALS



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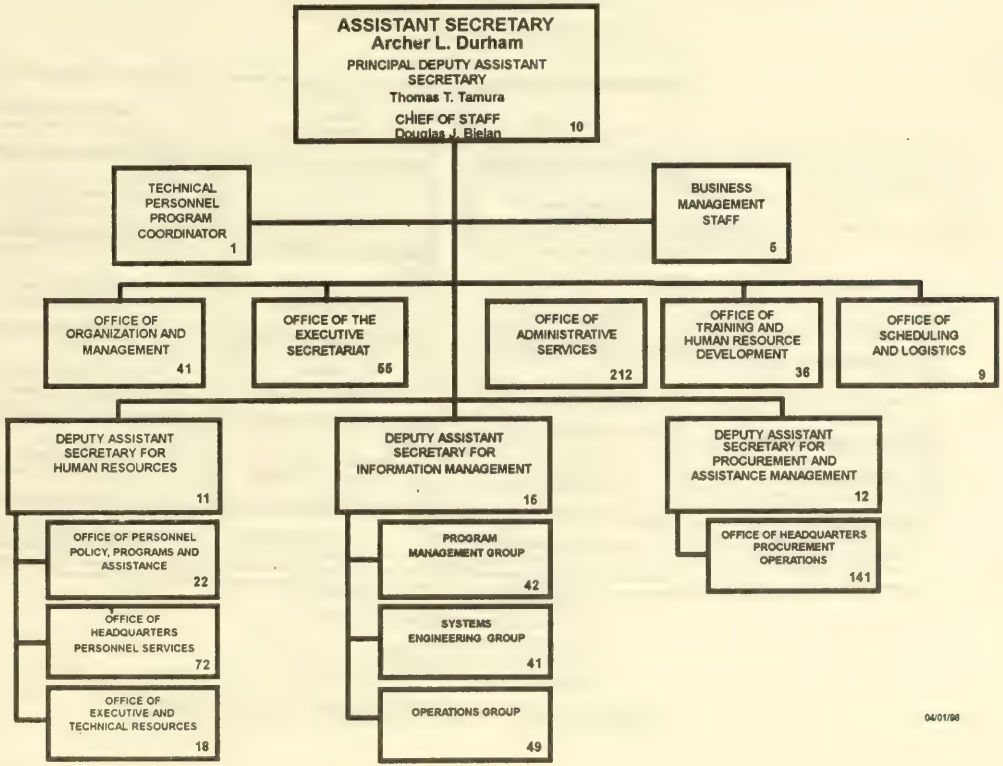
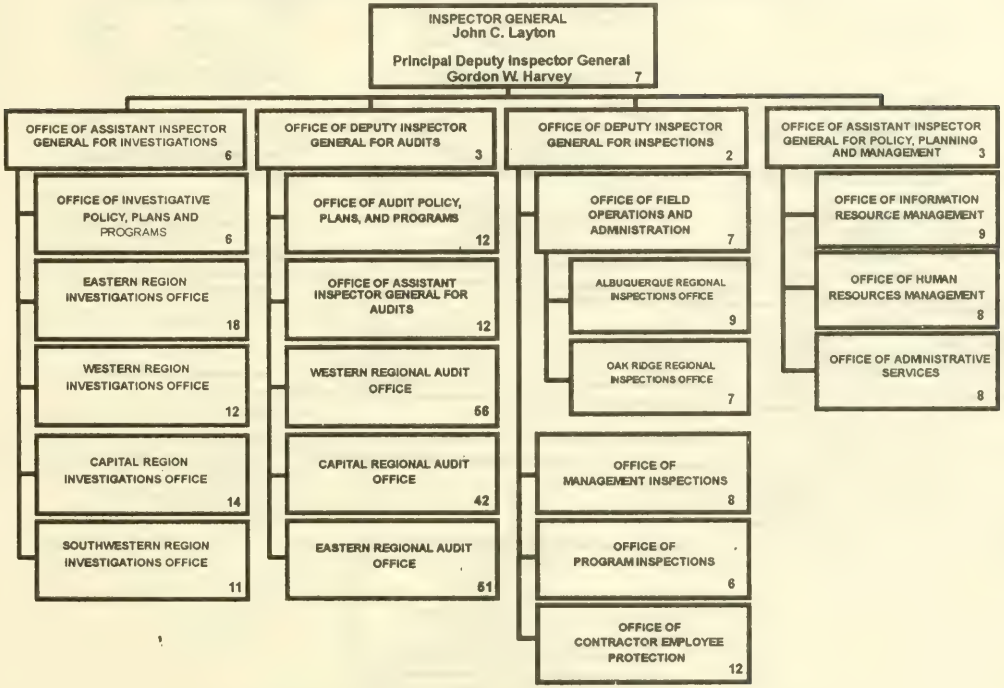
ASSISTANT SECRETARY FOR HUMAN RESOURCES AND ADMINISTRATION

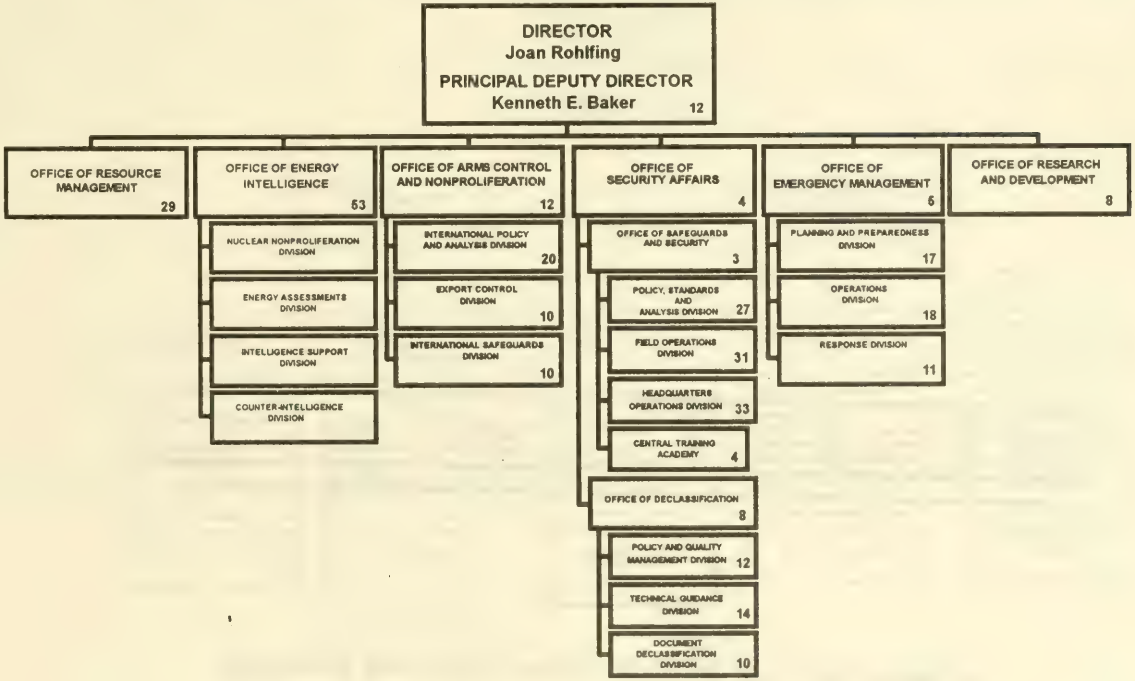


OFFICE OF INSPECTOR GENERAL


INSPECTOR GENERAL
John C. Layton
Principal Deputy Inspector General
Gordon W. Harvey 7
OFFICE OF ASSISTANT INSPECTOR GENERAL FOR INVESTIGATIONS 6
OFFICE OF INVESTIGATIVE POLICY, PLANS AND PROGRAMS 6
EASTERN REGION INVESTIGATIONS OFFICE 18
WESTERN REGION INVESTIGATIONS OFFICE 12
CAPITAL REGION INVESTIGATIONS OFFICE 14
SOUTHWESTERN REGION INVESTIGATIONS OFFICE 11
OFFICE OF DEPUTY INSPECTOR GENERAL FOR AUDITS 3
OFFICE OF AUDIT POLICY, PLANS, AND PROGRAMS 12
OFFICE OF ASSISTANT INSPECTOR GENERAL FOR AUDITS 12
WESTERN REGIONAL AUDIT OFFICE 56
CAPITAL REGIONAL AUDIT OFFICE 42
EASTERN REGIONAL AUDIT OFFICE 51
OFFICE OF DEPUTY INSPECTOR GENERAL FOR INSPECTIONS 2
OFFICE OF FIELD OPERATIONS AND ADMINISTRATION 7
ALBUQUERQUE REGIONAL INSPECTIONS OFFICE 9
OAK RIDGE REGIONAL INSPECTIONS OFFICE 7
OFFICE OF MANAGEMENT INSPECTIONS 8
OFFICE OF PROGRAM INSPECTIONS 6
OFFICE OF CONTRACTOR EMPLOYEE PROTECTION 12
OFFICE OF ASSISTANT INSPECTOR GENERAL FOR POLICY, PLANNING AND MANAGEMENT 3
OFFICE OF INFORMATION RESOURCE MANAGEMENT 9
OFFICE OF HUMAN RESOURCES MANAGEMENT 8
OFFICE OF ADMINISTRATIVE SERVICES 8

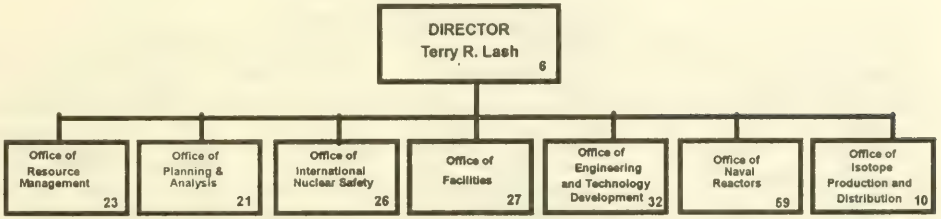
04/01/96

OFFICE OF NONPROLIFERATION AND NATIONAL SECURITY


DIRECTOR
Joan Rohlfing
PRINCIPAL DEPUTY DIRECTOR
Kenneth E. Baker 12
OFFICE OF RESOURCE MANAGEMENT 29
OFFICE OF ENERGY INTELLIGENCE 53
NUCLEAR NONPROLIFERATION DIVISION
ENERGY ASSESSMENTS DIVISION
INTELLIGENCE SUPPORT DIVISION
COUNTER-INTELLIGENCE DIVISION
OFFICE OF ARMS CONTROL AND NONPROLIFERATION 12
INTERNATIONAL POLICY AND ANALYSIS DIVISION 20
EXPORT CONTROL DIVISION 10
INTERNATIONAL SAFEGUARDS DIVISION 10
OFFICE OF SECURITY AFFAIRS 4
OFFICE OF SAFEGUARDS AND SECURITY 3
POLICY, STANDARDS AND ANALYSIS DIVISION 27
FIELD OPERATIONS DIVISION 31
HEADQUARTERS OPERATIONS DIVISION 33
CENTRAL TRAINING ACADEMY 4
OFFICE OF DECLASSIFICATION 8
POLICY AND QUALITY MANAGEMENT DIVISION 12
TECHNICAL GUIDANCE DIVISION 14
DOCUMENT DECLASSIFICATION DIVISION 10
OFFICE OF EMERGENCY MANAGEMENT 6
PLANNING AND PREPAREDNESS DIVISION 17
OPERATIONS DIVISION 18
RESPONSE DIVISION 11
OFFICE OF RESEARCH AND DEVELOPMENT 8

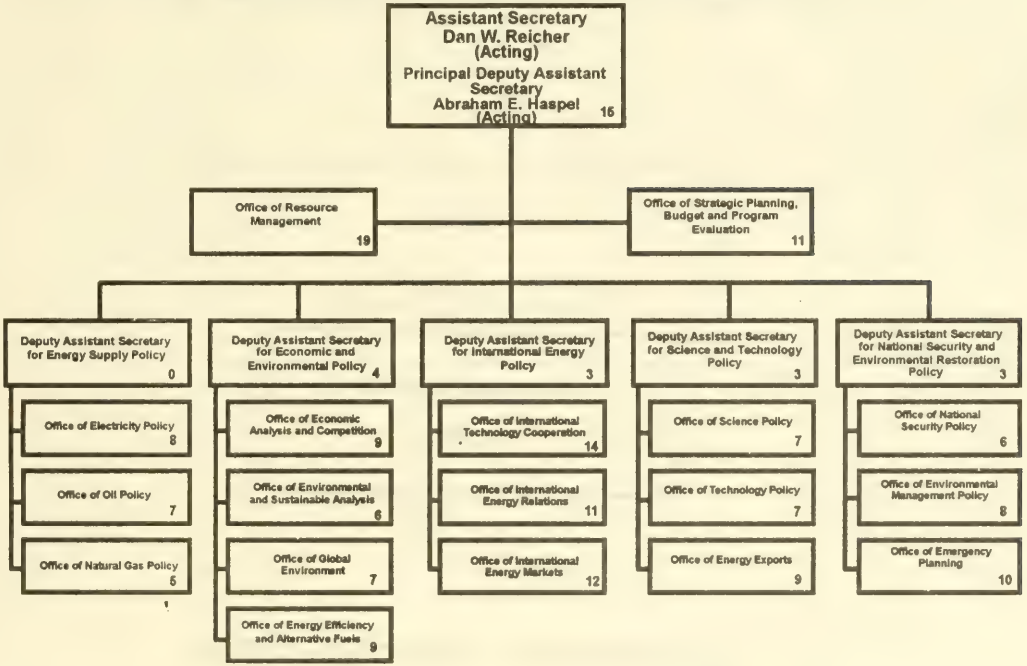
04/01/96

Office of Nuclear Energy, Science and Technology



04/01/96

ASSISTANT SECRETARY FOR POLICY



04/01/96

OFFICE OF QUALITY MANAGEMENT

DIRECTOR

Nancy K. Weidenfeller

11

OFFICE OF WORKER AND COMMUNITY TRANSITION

Director

Robert W. DeGrasse, Jr.

16

REALLOCATION OF FUNDS FROM PROGRAM AREAS TO FUND DEPARTMENT-WIDE INITIATIVES DIRECTED BY THE OFFICE OF THE SECRETARY

Mr. Myers. For fiscal years 1995 and 1996 to date, please provide specific program information relative to funding which has been reallocated from program areas to fund Department-wide initiatives directed by the Office of the Secretary. Please provide details as to the source of the funding and the specific activities which were funded.

Mr. Vivona. During all of FY 1995 and FY 1996, Secretary O'Leary has provided this Department with hands-on leadership and direction which in many cases has necessitated that she become directly involved in the initiatives and management of any number of DOE program activities. Therefore, it would be impossible to detail specific program funding in those areas receiving specific secretarial direction. The Secretary's proactive management style is such that she has and will continue to involve herself in all areas of the Department's missions to ensure the success and integrity of DOE programs.

EDUCATION

Mr Myers. By organization please provide a table showing the amount of funding spent on education activities throughout the Department for fiscal years 1995, 1996, and 1997

Secretary O'Leary. The Department has not budgeted for Education activities in a centralized account. In order to respond to this question it will be necessary to gather information from several different organizations. We have started this process so that we can provide the requested information as soon as possible. As soon as it is available, this information will be provided.

SECRETARY OF ENERGY
SUPPORT SERVICE COSTS FOR ENERGY AND WATER ACCOUNTS

Mr. Myers. Provide the following support service contractor information by (1) field element and (2) DOE headquarters organization for those prime DOE contracts which are supported by Energy and Water Development appropriations:

(A) Detail by contract for fiscal years 1995, 1996 and 1997, the end-of-year total headcount, associated FTE usage, and actual/estimated costs.
(B) Summary table for fiscal years 1995, 1996 and 1997 showing FTE and Dollar changes by contract.
(C) For fiscal year 1997 provide detail on total support service contracts (FTEs and dollars) as allocated to each major program (including those allocated to "landlord" programs).
(D) Provide any clarifying narrative which will help in analyzing data.

Secretary O'Leary. The Department is currently in the process of compiling this information on Support Services from all field and headquarters organizations. We expect to be able to provide this information to you by the end of May.

SUPPORT SERVICE CONTRACTS

Mr. Myers. For any support service contracts which have been/are planned for award by M&O contractors, provide the same information as requested above:

(A) Detail by contract for fiscal years 1995, 1996, and 1997, the end-of-year total headcount, associated FTE usage, and actual/estimated costs

(B) Summary table for fiscal years 1995, 1996, and 1997, showing FTE and dollar changes by contract.

(C) For fiscal year 1997, provide detail on total support service contracts (FTEs and dollars) as associated to each major program (including those allocated to "landlord" programs).

(D) Provide any clarifying narrative which will help in analyzing the data

For any which are identified in this category, provide a reason why the contract(s) are not prime DOE contracts.

Secretary O'Leary The information that has been requested is being obtained from the Field offices, and will be provided as soon as it is received and analyzed.

Mr. Myers. Using fiscal year 1995 as a baseline, provide detail on the specific work activities which have been subsequently contracted for as other-than support service contracts (i.e., performance-based contracts, etc) and, accordingly, are not reflected as a support service contract in either fiscal year 1996 or fiscal year 1997 The answer should address the contractor under which the work was/is to be done with associated FTEs and dollar for both fiscal years. (Example: A mail room operation which previously was a support service contract, but as a part of contract reform was directed to some other type of performance contract).

Secretary O'Leary. It is the nature of the work, not the contract type, which determines whether a contract is coded as support services or not. If a support service contract was awarded using performance based criteria, it will be coded as a support service contract irrespective the extent of the use of performance based contracting methods. Similarly if a contract is modified to include such criteria, it remained designated as a support service contract, and thus are so recorded in the Department's management information systems

Mr. Myers. Provide a summary table by (1) field element and (2) DOE headquarters showing profiles of federal employee and supporting support service contracts for fiscal year 1995, 1996 and 1997 which are/will be funded in Energy and Water Development appropriations. The profile should show the trends by field/headquarters element relative to the total inventory of employees involved in performing and/or supporting the federal function at the various DOE locations. Show on an FTE basis with appropriate narrative which will assist in clarifying and analyzing the data.

Secretary O'Leary The information on federal employees that has been requested is being obtained from all DOE organizations, the information on FTE's at supporting support service contractors is being obtained from DOE field offices Data in both of these categories will be provided as soon as it is received and analyzed

Mr. Myers. In a recent Inspector General report, evidence was presented indicating that DOE headquarters organizations frequently disregard Departmental policy prohibiting use of field element M&O prime contracts for headquarters support Provide information which addresses specifically what the DOE headquarters organizations have/are doing to curtail/terminate this long-standing practice.

Secretary O'Leary On September 22, 1995, I issued a directive to all organizational elements prohibiting the use of management and operating (M&O) contractor employees to compensate for reduced support services I would like to insert a copy of this memorandum for the record. To follow up on my directive, my staff is conducting a survey to determine the number and use of M&O employees at Headquarters Where it is determined that a M&O employee is being inappropriately utilized, the responsible organizational element will be required to eliminate that position. A system of monitoring is being established to ensure that such positions are eliminated and that no other M&O employees are utilized to recoup for lost support services. (The information follows:)

The Secretary of Energy
Washington, DC 20585

September 22, 1995

MEMORANDUM FOR HEADS OF DEPARTMENTAL ELEMENTS

FROM: HAZEL R. O'LEARY

SUBJECT: Prohibition of Use of Management and Operating Contractors to Compensate for Reduced Support Services Contracting

One of the important Strategic Alignment actions is to significantly reduce our reliance on support service contracting. Specifically, we must reduce support service contracting by $90M per year for fiscal years 1996 through 2000, resulting in total savings of $450M.

The Strategic Alignment Implementation Group found that both Headquarters and the field also use staff provided by management and operating contractors. These contractors manage and operate unique facilities that are critical to meeting the missions of the Department of Energy.

The people employed by these contractors have technical capabilities and expertise that are unparalleled. As such, they assist the Department in meeting its many challenges. They should not be assigned at the Department's request to provide services that are tangential to their expertise and their missions in order to compensate for the reductions in support service contracting that we have agreed upon.

Therefore Department offices shall not require these contractors to provide services that are not part of the particular expertise associated with their stated missions. These contractors shall not be required, nor should they propose, to provide administrative or management support services that should be performed either by Federal employees or by a contractor engaged, consistent with our reduction requirement, for the specific purpose of providing such services. To the extent that those types of services presently are being provided by management and operating contractors or performance based management contractors, they shall be ended no later than December 31, 1995.

Your continued leadership as we implement Strategic Alignment is vital. Working together, we can continually improve our operations to better serve the citizens of our Nation.

If you have any questions, please contact Richard H. Hopf, Deputy Assistant Secretary for Procurement and Assistance Management, at (202) 586-8613.

SUPPORT SERVICE CONTRACTS

Mr. Myers. The Department was directed to provide a semi-annual report on the use of support service contractors in fiscal year 1996 What is the status of that report?

Secretary O'Leary The second quarter of Fiscal Year 1996 ended March 31, 1996 We are preparing a report which will reflect the Department's reductions in support service contracting for the first half of the fiscal year

SECRETARIAL TRAVEL

Mr. Myers. House Report 104-293 (accompanying H.R. 1905, the Energy and Water Development Appropriations Act, 1996) imposed certain limitations and requirements in respect to Secretarial travel. The report, for example, clearly and expressly instructed the Department to, "provide sufficient detail in its budget justifications [beginning in fiscal year 1997] for the Office of the Secretary to provide for identification of resources budgeted for secretarial travel." What is the budget request for Secretarial travel in fiscal year 1997, including travel funded in other departmental accounts for employees who directly support the Office of the Secretary.

Secretary O'Leary. The FY 1997 travel request for the Office of the Secretary is $307,000. This includes the travel costs of all employees of the Office of the Secretary as well as any security personnel traveling with the Secretary.

Mr. Myers. The report also provided that costs to support travel of the Secretary, any special assistants funded through the Office of the Secretary, and any security detail accompanying the Secretary are to be absorbed within the line item for the Office of the Secretary. Has the Department complied with this requirement? Please provide for the record the travel costs of the Secretary's security detail in fiscal year 1996 to date and identify with particularly the source of funds supporting this activity.

Secretary O'Leary. In FY 1996, the Department has and will comply with the report suggestion that all security travel costs associated with the Secretary's travel be funded from the Office of the Secretary. The costs of security travel associated with the Secretary have totaled $85,284 to date in 1996. These costs have been funded from the Office of the Secretary's travel budget.

Mr. Myers. The Department was also required to notify the Committee on Appropriations of any internal reprogramming executed to directly or indirectly support departmental travel, regardless of costs. The Committee has received no reprogramming notifications for fiscal year 1996 and assumes that no internal reprogramming have been executed which support travel in any way. Is this assumption warranted?

Secretary O'Leary. The Department has not reprogrammed any funds in 1996 in support of travel in any amount. Further, no such reprogramming is currently envisioned. Should the need for such a reprogramming arise, the Committee on Appropriations will be notified, consistent with the committee's request.

Mr. Myers. H.R. 104-293 also stated: "No funds provided by this Act may be used to host or subsidize the travel of any non-Federal participants in secretarial missions. Has the Department complied with this requirement? Please provide for the record the names of all non-Federal participants in secretarial missions to date in FY 1996; for each participant, please list the amounts remitted to the Department as reimbursement for travel costs.

Secretary O'Leary. The Secretary has not undertaken any trade missions since the Committee asked that no funds be used to support non-Federal participants. Further, current Departmental policy requires that all non-Federal travelers pay their full share of the costs of any mission travel. No Secretarial missions have occurred in FY 1996.

Mr. Myers. The Department was also instructed to provide semi-annual reports on Secretarial travel. When can the Committee expect to receive the first such report?

Secretary O'Leary. The Department is currently preparing the requested report and hopes to have it completed and available by April 30, 1996.

OFFICE OF ENERGY RESEARCH
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH PROGRAM

Mr Rogers. Please provide a status report on the Department's Experimental Program to Stimulate Competitive Research program.

Dr. Krebs. In fiscal year 1996 there is $7 million available to support the Department of Energy/Experimental Program to Stimulate Competitive Research research efforts for 21 research clusters in eight states and the Commonwealth of Puerto Rico. Each of these commitments is up to six-years, some of which will end in fiscal year 1999 and others in fiscal year 2000, and fiscal year 2001. Some of these research clusters are doing very well in carrying out their research, involving students, both graduates and undergraduates, and in getting their laboratories set up. Others are still in their formative stage, but are making progress toward the actual conduct of research. Interactions with the state Experimental Program to Stimulate Competitive Research organizations have been developing very well as we find ways to work with each other to strengthen the overall effort

Mr. Rogers. Describe the 1997 request for Experimental Program to Stimulate Competitive Research and how it meets the program's goals?

Dr. Krebs. The fiscal year 1997 request will continue support for the Experimental Program to Stimulate Competitive Research program as previously described, with continued emphasis on developing more interactions with the Department of Energy national laboratories

Mr. Rogers. How are states being selected for participation in the program, and to what extent is matched funding required?

Dr. Krebs. In fiscal year 1996, because of funding limitations, only those states with existing Department of Energy/Experimental Program to Stimulate Competitive Research research implementation awards are eligible for funding The research implementation awards were evaluated by peer review and site visit reviews to provide a basis for the selection of the awards that were made. State matching funds are required on a 50-50 basis

Mr. Rogers. I understand that the Experimental Program to Stimulate Competitive Research program has been integrated into the Basic Energy Sciences research program and other activities of the Office of Energy Research. Explain how that has occurred

Dr. Krebs. The fiscal year 1996 Energy and Water Development Appropriations House and Senate Report directed that the Department of Energy/Experimental Program to Stimulate Competitive Research program be moved to the Basic Energy Sciences program in the Office of Energy Research. The Department of Energy/Experimental Program to Stimulate Competitive Research program has indeed been integrated into the Basic Energy Sciences research program. The Department of Energy/Experimental Program to Stimulate Competitive Research program management continues to interact with the other Department of Energy programs to develop awareness and opportunities within the various research programs, to obtain expert help where it

can best be provided (such as the selection of reviewers), to obtain support for scientists from Experimental Program to Stimulate Competitive Research states from the research programs, to develop opportunities at the Department of Energy laboratories for Experimental Program to Stimulate Competitive Research-supported scientists, etc. We expect that the Department of Energy/Experimental Program to Stimulate Competitive Research program will support research of high quality just like the research supported in the research programs, and we feel that this is best accomplished in this environment.

Mr. Rogers. What is the Department's plan to further develop this program in future years?

Dr. Krebs We will continue to develop the Department of Energy/Experimental Program to Stimulate Competitive Research program so as to increase the interaction of Experimental Program to Stimulate Competitive Research scientists with the Department of Energy National Laboratories, to encourage research collaborations with other Department of Energy-supported scientists where feasible, to make it possible for proposals from Experimental Program to Stimulate Competitive Research states to become even more competitive, and to become an increasingly important part of the Nation's research enterprise

Mr. Rogers. What do you foresee to be its budget through fiscal year 2000?

Dr. Krebs. In looking at the fiscal year 2000 budget, we see that research support for all areas will come under increasing pressure We expect that the Experimental Program to Stimulate Competitive Research program will also be subject to same pressures. However, we are committed to having a strong research program in the Experimental Program to Stimulate Competitive Research states and we want to optimize the opportunities for this in every way we can.

PERFORMANCE BASED CONTRACTS

Mr. Knollenberg. Do you still consider the Rocky Flats Performance Based Contract as a successful model that the Department should move towards at the other cleanup sites?

Admiral Guimond. Yes. While the Rocky Flats model is not perfect, overall around the complex where we have used performance based contracting, i.e., Bechtel Hanford, West Valley Nuclear Services, among others, it has been demonstrated to be an effective tool for motivating and directing contractor performance. Even with the initial "learning curves" for both contractor and Federal staff, it has been much more successful than the subjective approach formerly used. The most significant benefit of the performance based type contract is that the Department pays for work accomplished rather than guaranteeing a fee to the contractor for performing "business as usual."

PERFORMANCE BASED CONTRACTS

Mr. Knollenberg. Specifically, what improvements in cost and schedule have occurred?

Admiral Guimond. At Rocky Flats, the most dramatic results have been improvement in schedule. For example, in the Third Quarter, FY 1995, under the previous award fee contract, no waste was shipped and no tanks were drained. Following execution of the performance based contract, Spent Nuclear Material, Low Level Waste and Low Level Mixed Waste were shipped and 1,181 tanks were drained.

PERFORMANCE BASED CONTRACTS

Mr. Knollenberg. What problems have been encountered in moving to an incentive based Management and Integrating contract instead of an award fee, cost reimbursement Management and Operating Contract?

Admiral Guimond. Some problems have surfaced from the new contracting approach, ranging from a difficulty in accurately developing performance measures that best reflect the scope of work of each task and which relate directly to the incentives, to retraining DOE employees in areas such as cost-estimating and cost-engineering that performance-based contracting requires.

Because we are in the early stages of the new contracting approach, it is difficult to comprehensively assess problems or benefits that have surfaced or will ensue. It is too early to draw final conclusions regarding the success or failure of the new contracting approach. These contracts must be in place longer before we can fully evaluate what is and is not working. However, it is fair to say we have encountered some problems as well as some dramatic improvements.

Some dramatic performance improvements resulting in much lower costs are already occurring in areas incentivized by fee, such as lower indirect costs and reduced characterization and assessment study expenditures. We are increasing the use of incentives that are results-oriented and focus contractor fees on measurable performance and away from fee guarantees whenever possible, and we are establishing a more direct relationship between fee earned and benefit to the government. The Department is attempting to better integrate "best practices" into the normal work course and continually improve our approaches, techniques, and practices for both contract formulation and contract administration. I am confident that we have embarked on a course of action that will make our contracting more cost-effective and our contractors more efficient in their work efforts.

PERFORMANCE BASED CONTRACTS

Mr. Knollenberg. With this type of contractual arrangement, do we need fewer Feds in the field overseeing the contract?

Admiral Guimond. Contract administration is labor intensive. At this early stage of implementing performance-based contracting, we are assigning additional resources to contract oversight even though the total staff at the Operations/Field Offices is declining. One positive aspect of the Department's Strategic Alignment Initiative is the better definition of Headquarters and Field roles, including focused contractor oversight in the field.

The shift in contract administration culture is significant and requires the focus to be more on performance and less on compliance, emphasizing results and not process, and substitutes industry best practices for the Federal norm. This shift is requiring the Department staff to be retrained to fundamentally change and improve the way the Department conducts it business. DOE personnel are still transitioning to the new contractual arrangements. As the staff becomes better trained, adjusts to their new responsibilities and the new culture, and becomes more familiar with the new contracting vehicles, staffing needs can diminish somewhat. For the present, we continue to learn lessons regarding what these new contractual arrangements entail. It is still too early to gauge with any accuracy what our true Federal staffing requirements for contract oversight will be.

Mr. Knollenberg. What other performance based contracts are in place?

Admiral Guimond. Most of the contracts with a primary work scope of supporting the Office of Environmental Management have incorporated performance based contracting initiatives through renegotiated or competitively award contracts. These contracts include: Bechtel Hanford; Fernald Environmental Management Company; Lockheed-Martin Idaho Technology Company; West Valley Nuclear Services; Westinghouse Electric Company, Waste Isolation Division; Westinghouse Hanford Company, and Westinghouse Savannah River Company. As the next step in performance-based contracting, fixed price incentives are being introduced in task orders at Oak Ridge and are expected to be included in the new contract at the Savannah River Site.

The Department continues to encourage innovative proposals from contractors bidding on Departmental requests for proposals. We are confident that as we move to broader based implementation of performance-based contracting, the insights gained by both contractor and Federal staff will lead to greater effectiveness in the future.

PERFORMANCE BASED CONTRACTS

Mr. Knollenberg. What results have been achieved there?

Admiral Guimond. An example of the type of savings possible with the use of "results-oriented" performance based contracting has been demonstrated at the Idaho National Engineering Laboratory (INEL). At the INEL, the Advanced Test Reactor is operating at costs that are the lowest since 1991, with an estimated cost savings of $800,000.

The Department continues to examine "lessons learned" from performance-based contracting and to share these lessons to improve contractor effectiveness at all Departmental sites.

At Rocky Flats, similar dramatic results in performance improvements have been realized. For example, off-site shipments of low level waste and low level mixed wastes have been accelerated in FY 1995, with three mega-loads being shipped versus none in the previous year.

EMPLOYMENT REDUCTION

Mr. Knollenberg. The close of the Cold War has had an interesting effect on employment at the Department of Energy. Shutting down the nuclear defense production facilities resulted in a huge increase in employment at the Department's facilities. Only within the last year has employment been brought back toward production levels. How have you accomplished these reductions?

Mr. DeGrasse. Department of Energy prime contractor employment increased during the period from fiscal year 1988 to 1992 during a period of transition. The decision of the previous administration to end the nuclear production mission did not occur until late in this transition period. At the same time, there was an increased commitment to environmental remediation at defense production sites and subsequent hiring.

When the new Administration began, it was clear that reductions were necessary in the Department's contractor work force. The needed reductions came as a result of the decision to end the production mission subject to legal and regulatory requirements, technical changes and declining budgets. The Congress recognized this requirement as well and enacted section 3161 of the Fiscal Year 1993 Defense Authorization Act to establish objectives for achieving these needed reductions. These objectives, including mitigating the economic and social impacts on workers and communities through tools such as early retirements, voluntary separation incentives, education and training assistance, and transition medical benefits, are consistent with practices developed by many leading private companies who have faced similar requirements.

Through fiscal year 1995, approximately 80 percent of prime contractor separations have been through voluntary means of these 21 percent were through early retirement, 41 percent through voluntary separation incentive programs, 17 percent through attrition, and one percent through transfer to other DOE sites.

THE COST OF THE BUILD UP IN THE 1990S

Mr. Knollenberg. I understand that most of the reductions are within the contractor organization, but that sizeable cuts in the federal work force are also anticipated through your strategic alignment. Can you please tell me the cost of right-sizing the entire Department, contractors and feds?

Mr. Pearman. The Strategic Alignment Implementation Plan projects cuts in the Department's federal work force of 3,788 by the end of FY 2000. The Department has established the cost of retaining out placement and federal service early retirement buyouts of $165.5M. The total projected Alignment Savings are estimated at $1,770.6M.

The Department has requested $67 million in FY 1997 for the Worker and Community Transition line item. Future requests will, of course, be based on future assessments of requirements. Since FY 1993, the Department has expended $575 million through work force restructuring plans at former defense sites, or an average of $24,500 per each of 23,470 separated prime contractor workers. Approximately one half of these costs would have been incurred if separations had been all made involuntarily with no Worker and Community Transition program. An additional $127 million has been provided for community transition assistance.

EARLY RETIREMENT

Mr. Knollenberg. How many contractors across the complex took advantage of early retirement?

Mr. DeGrasse. From the beginning of Fiscal Year 1993 to date, 4,758 prime contractor employees for the Department of Energy were offered and accepted early retirement. This represents approximately 21 percent of prime contractor separations for the same time period. The majority of early retirements occurred at Oak Ridge, Savannah River, Richland, and Idaho.

Mr. Knollenberg. Were so called "Golden Parachutes," or retirement incentives, used to encourage early retirement?

Mr. DeGrasse. Early retirement programs have been offered at several sites when it was determined that these programs were an appropriate means to meet the objectives of work force restructuring consistent with section 3161of the Fiscal Year 1993 Defense Authorization Act. Overall, 4,758 prime contractor employees separated during fiscal years 1993-1995 through early retirement programs; approximately 21 percent of total prime contractor employees. These programs were intended to encourage early retirement in order to minimize involuntary separations.

Mr. Knollenberg. What was the fiscal impact of these"Golden Parachutes?"

Mr. DeGrasse. From the beginning of Fiscal Year 1993 to date, the total cost of implementing early retirement programs across the complex is approximately $200 million. This total program cost reflects an actuarial calculation of the total accrued costs of funding early retirement benefits over a 10 year period. Of this $200 million, a total of $59 million at Oak Ridge, or nearly 30 percent of total program costs, was funded by excess assets in the contractor retirement fund.

Mr. Knollenberg. What was the average cost of their separation packages?

Mr. DeGrasse. The average cost of all early retirement packages offered and accepted across the complex, from the beginning of Fiscal Year 1993 to date, is approximately $42,000 per separation. As I have noted, this cost reflects an actuarial calculation of the total accrued costs of funding early retirement benefits per separation over a 10 year period.

Mr. Knollenberg. What stipulations were placed on these folks?

Mr. DeGrasse. Guidance provided to Field Offices for consideration of early retirement incentives provide that these incentives should be analyzed with respect to the likely candidates eligible to accept, and the potential effects on critical skills needed to carry out the site mission. It also highlights a number of legal issues that must be considered relative to offering such an

incentive.

Employees participating in early retirement programs are generally not eligible for other forms of assistance provided to separated workers, including education and relocation or Displaced Workers Medical benefits. Field organizations are also directed to include in restructuring plans mechanisms to ensure that individuals accepting an early retirement incentive are not inappropriately rehired. Such mechanisms could include post-employment restrictions requiring repayment of the incentive and limiting the number of waivers of any restrictions for critically skilled individuals.

PERSONNEL COST

Mr. Knollenberg. What is your estimate of the total cost to the government in the form of additional pensions, fringe benefits (including health care), salaries, resulting from excessive build up of personnel and subsequent downsizing?

Mr. DeGrasse. Between the end of fiscal year 1988 and the end of fiscal year 1992 prime contractor employment at Department of Energy sites increased from a total of approximately 127,000 to a total of approximately 148,700, or about 21,000.

This increase reflects a number of factors, as I discussed earlier. The first announcement of a unilateral reduction in the U.S. nuclear arsenal did not occur until September 1991, meaning that for the bulk of this period of increase there was an ongoing nuclear weapons production requirement. At the same time, the Department, under Secretary Watkins, recognized the requirement to further increase its commitment to remediation of environmental contamination at DOE sites. In addition, reductions in the Department's budget since fiscal year 1992 of more than 20%, measured in constant dollars, have required reductions in the contractor work force since these personnel costs represent a substantial portion of overall Departmental spending.

Information is not available to accurately calculate the total costs associated with the increase and subsequent reduction in the Department's prime contractor employment since 1992. Personnel benefits and costs vary by contractor and by the work performed by individual employees. Since Secretary O'Leary took office, her objective has been to better match the Department's Federal and contractor work force with future mission requirements, consistent with budget constraints. The Department stands by our performance to date toward this objective and pledges to continue to do what is necessary to redefine an appropriate work force consistent with Congressional direction, legal requirements and best business practices.

Mr. Knollenberg. Please explain what are the highest risk areas in the EM program today.

Admiral Guimond. In early 1995, in response to a Congressional request, we performed an inventory of risks at our sites, to see how EM activities were addressing risks. This evaluation was conducted by Field personnel, who were most familiar with the risks, as a consequence of performing other risk evaluations at the site, including Remedial Investigations, Safety Analysis Reports, Environmental Impact Statements, etc.

The inventory qualitatively measured risk in three ways, 1) risk to the public, 2) risk to site personnel, and 3) risk to the environment. Based on the data collected in 1995, several cleanup, remediation, and stabilization activities were categorized as either having the highest possible rating in one of these three categories, or of having "high" ratings in all three categories. In summary:

- We have confirmed our previous findings that unstable plutonium, high level radioactive waste tanks, and corroded spent nuclear fuel and targets pose urgent risks to the public, to site personnel, and to the environment.

- The greatest risks from unstable plutonium were at several sites including: many buildings at Rocky Flats; buildings, processing lines, and canyons at Savannah River; and the Plutonium Finishing, "PUREX", and "B" plants at Hanford.

- The greatest risks due to high level radioactive waste tanks were from the Hanford 200-Area tank farms, the Savannah River Site H- and F-tank farms, and the Oak Ridge gunnite tank farm.

- The greatest risks from corroded spent nuclear fuel and targets were found in the Hanford K-basin, the Savannah River Site canyons, and in the Molten Salt reactor at Oak Ridge.

The EM program is responsible for many other high risks to the public, site personnel, or the environment. These include:

- The West Valley Site in New York State, which poses high risks from the high level nuclear waste that was improperly stored and disposed there.

- Fernald Operable units 2,4, and 5 in Ohio pose high risks to the public and to the environment from Uranium 238, Lead, and other hazardous wastes.

- The nuclear weapons test sites in Nevada.

Revised information on risks in the Environmental Management program will be available in May 1996, when it is collected under revised criteria and peer-reviewed for use in the FY 1998 budget process.

RISKS

Mr. Knollenberg. What about them is hazardous at this point?

Admiral Guimond. The four principal safety issues that still remain for the Hanford tanks are (1) flammable gas, (2) ferrocyanide, (3) high organic content, and (4) high heat. Of these safety issues, an uncontrolled flammable gas burn is of greatest concern, as explained below. There are 54 tanks for which these safety hazards may exist, referred to as Watchlist Tanks. An accident in any one of these tanks, although not considered a high or probable risk, could result in a release of radioactive material to the environment.

The flammable gas safety issue (affecting 25 tanks) revolves around the fact that certain tanks at Hanford generate gas mixtures that contain both a fuel and an oxygen source with the principal concern being the generation of hydrogen and nitrous oxide. If the viscous solids in the tank trap a significant volume of this gas mixture, its release and ignition can cause an explosion that would result in the release of some radioactive material. We have virtually eliminated the risk of a tank explosion from the buildup of flammable gases in the highest risk tank at Hanford (tank 101-SY) by installing a state of the art pump, which has exceeded design expectations in its first two years of operation. The mixing pump allows any generated gases to be released on an intermittent basis and, thereby, prevents the build-up of a sufficient gas mixture volume to be of concern.

Both the ferrocyanide and high organic safety issues concern chemical reactions that, if they occur, release sufficient energy to damage the tank and result in the release of radioactive material. The principal reaction of concern for both ferrocyanide and organics is with nitrites and nitrates. Based on sampling and modeling work conducted over the last few years, DOE is very close to ruling out the possibility of the ferrocyanide reactions, and has made substantial progress on resolving the organic safety issues.

The high heat safety issue affects one tank and results from radionuclide heating that, if uncontrolled, could cause structural damage to this tank. Currently water is periodically added to the tank to control the temperature. By the end of 1997, we expect to transfer most of the waste in this tank to a tank designed for much higher temperature and, thereby, resolve this safety issue.

Risks from unknown sources may be as great as the risks we know. We have made substantial progress toward characterizing the waste in the 177 High Level Waste tanks. However, there still exists considerable uncertainty regarding the specific radionuclide and chemical make-up of various tanks.

RISKS

Mr. Knollenberg. Do the tanks at Hanford still present a high risk?

Admiral Guimond. Yes. As mentioned previously, the radioactive waste storage tanks at Hanford are among the highest rated risk areas in the DOE complex. The risks, however, are substantially less than they were prior to 1993, when a mixing pump was inserted into the highest risk tank (Tank 101-SY), and substantial knowledge and experience has helped monitor and control risks.

ADDITIONAL MISSIONS FOR THE DOE

Mr. Knollenberg. I understand that recently there was a Record of Determination calling for a transfer of over 500 FTEs from the Bureau of Mines to the Department of Energy. Is this information accurate?

Secretary O'Leary. The Congress, in Conference Report 104-173 that accompanied the Department of Interior and Related Agencies Appropriation Bill, 1996, proposed the termination of the Bureau of Mines. The termination was made complete in P. L. 104-99 signed by the President. The Public Law also provided for the transfer of the health and safety functions of the Bureau and the materials research program to the Department of Energy, Fossil Energy Research and Development program area. The transfer included 527 FTE employees and a budget of $40.0 million in FY 1996. With the Public Law as guidance; the Departments of Energy and Interior prepared the documents necessary to accomplish the transfer. The document is called a Determination Order and is the agreement between the two agencies and approved by the Director of the Office of Management and Budget on how the transfer of functions and property will take place.

Mr. Knollenberg. What are the FY 1996 and FY 1997 budget ramifications of this FTE transfer?

Secretary O'Leary. In FY 1996 the Department of Energy under the Interior Appropriations received $40.0 million and 527 FTEs. In the FY 1997 Budget Request, the Administration is proposing the transfer of 413 FTEs to the Department of Health and Human Services. The Department of Energy, Fossil Energy research and development program would retain 85 FTEs and request $5 million for the Albany Research Facility in Oregon as directed in the FY 1996 Conference Report, and 29 FTEs at the Pittsburgh Bruceton Research Facility will report to the Assistant Secretary for Environmental Management. The Department of Health and Human Services is requesting $32 million for mine safety and health.

Mr. Knollenberg. Why would we increase the staffing levels of the Department of Energy in a time when we are trying to streamline the Department?

Secretary O'Leary. At the direction of the Congress, the Department of Energy sought to find the best possible home for the programs at the Bureau that were not terminated. Thus the bulk of the Bureau is being proposed for transfer to the Department of Health and Human Services. The programs proposed to remain at the Department of Energy were those with the best programmatic fit such as the materials program which will remain in the Interior account in Fossil Energy Research and Development and the Environmental Technology Research Group which is proposed for transfer to the Office of Environmental Management. The Environmental Technology Research Group, with 29 FTEs that can positively contribute to

the Environmental Management mission. The group has both laboratory and field capabilities, site characterization and groundwater monitoring experience and general water treatment capabilities. Examples of capabilities relevant to Environmental Management include:

- Application of in-line aeration and treatment to Environmental Management wastewater treatment requirements.
- Application of bacterial sulfate reduction to the treatment of hazardous waste sites.
- Subsurface diagnostics for hazardous waste sites.
- Site characterization of hydraulic and geochemical regimes.

SUCCESSES OF EM PROJECTS

Mr. Knollenberg. During testimony, Secretary O'Leary stated that 194 cleanup sites have been completed. Will the Department please submit for the record a list of those 194 sites. Secretary O'Leary also mentioned that there is a total of 705 sites. Will the Department please submit for the record a list of these 705 sites.

Admiral Guimond. Attached for the record is a listing of the 705 sites/ projects discussed in my testimony, which includes 194 sites completed through the end of FY 1995. This former method of listing projects has recently been replaced by an improved tracking system which will list individual release sites and facilities. This database will maintain a list of approximately 10,000 release sites and facilities for tracking progress and individual site completions.

Detailed on the attached listing are the actual sites, individual project names, and locations which made up this former method of tracking Environmental Restoration cleanup activities. The 194 completed sites are identified on this list.

ENVIRONMENTAL RESTORATION SITES/PROJECTS

Site Name	Project Name	State	Status
AMES LABORATORY (AMES)	AMES CHEMICAL DISPOSAL SITE	IA	
AMES	INACTIVE WASTE SITES	IA	Complete
AMES	UST CONTAMINATION	IA	
ARGONNE NATIONAL LABORATORY-EAST (ANL-E)	100 AREA	IL	
ANL-E	317/319/ENE AREA	IL	
ANL-E	570 HOLDING POND	IL	
ANL-E	800 AREA LANDFILL	IL	
ANL-E	EAST AREA SEWAGE TRMT PLANT	IL	
ANL-E	INACTIVE WASTE SITES MGMT PLAN	IL	
ANL-E	LIME SLUDGE REMOVAL	IL	
ANL-E	OUTFALL AREA	IL	
ANL-E	SAWMILL CREEK	IL	
ANL-E	SITEWIDE HYDRO BASELINE STUDY	IL	
ANL-E	SITEWIDE WELL & BOREHOLE CLOSE	IL	
ANL-E	SLD WST MGMT UNITS ASSMNT	IL	
ANL-E	UST REMOVAL	IL	Complete
ARGONNE NATIONAL LABORATORY-WEST (ANL-W)	OU 9-01	ID	
ANL-W	OU 9-02 EBR-II LEACH PIT	ID	
ANL-W	OU 9-03	ID	
ANL-W	OU 9-04 COMP RI/FS	ID	
ANL-W	PCB SPILL CLEANUP	ID	Complete
BROOKHAVEN NATIONAL LABORATORY (BNL)	OU-1	NY	
BNL	OU-2	NY	
BNL	OU-3	NY	
BNL	OU-4	NY	
BNL	OU-5	NY	
BNL	OU-6	NY	
BNL	OU-7	NY	
CHICAGO OFFSITE LOCATIONS	SITE A/PLOT M	IL	
FERNALD SITE (FERNALD)	CLOSURE OF TANKS T5/6	OH	Complete
FERNALD	CLOSURE OF THE N&S SOLVENT TANKS PILOT PLANT	OH	Complete
FERNALD	OU 1	OH	
FERNALD	OU 2	OH	
FERNALD	OU 3	OH	

Site Name	Project Name	State	Status
FERNALD	OU 4	OH	
FERNALD	OU 5	OH	
FERNALD	UNDERGROUND STORAGE TANK REMOVAL 14	OH	Complete
FERNALD	UNDERGROUND STORAGE TANK REMOVAL 17	OH	Complete
FERNALD	UNDERGROUND STORAGE TANK REMOVAL 5	OH	Complete
FERNALD	UNDERGROUND STORAGE TANK REMOVAL 7	OH	Complete
FUSRAP	ACID/PUEBLO CANYONS	NM	Complete
FUSRAP	ALBA CRAFT	OH	Complete
FUSRAP	ALBANY RESEARCH CENTER (ARC)	OR	Complete
FUSRAP	ALIQUIPPA FORGE	PA	Complete
FUSRAP	ASHLAND 1	NY	
FUSRAP	ASHLAND 2	NY	
FUSRAP	ASSOCIATE AIRCRAFT	OH	Complete
FUSRAP	B&T METALS	OH	
FUSRAP	BAKER AND WILLIAMS WAREHOUSES	NY	Complete
FUSRAP	BAKER BROTHERS	OH	
FUSRAP	BAYO CANYON	NM	Complete
FUSRAP	BLISS & LAUGHLIN STEEL	NY	
FUSRAP	C. H. SCHNOOR	PA	Complete
FUSRAP	CHAPMAN VALVE	MA	Complete
FUSRAP	CHUPADERA MESA	NM	Complete
FUSRAP	COLONIE	NY	
FUSRAP	COMBUSTION ENGINEERING	CT	
FUSRAP	DUPONT & COMPANY	NJ	
FUSRAP	ELZA GATE	TN	Complete
FUSRAP	GENERAL MOTORS	MI	Complete
FUSRAP	GRANITE CITY STEEL	IL	Complete
FUSRAP	HERRING-HALL MARVIN SAFE CO.	OH	Complete
FUSRAP	KELLEX/PIERPONT	NJ	Complete
FUSRAP	LATTY AVENUE PROPERTIES	MO	
FUSRAP	LINDE AIR PRODUCTS	NY	
FUSRAP	LUCKEY	OH	
FUSRAP	MADISON	IL	
FUSRAP	MAYWOOD	NJ	
FUSRAP	MIDDLESEX MUNICIPAL LANDFILL	NJ	Complete
FUSRAP	MIDDLESEX SAMPLING PLANT	NJ	

Site Name	Project Name	State	Status
FUSRAP	NATIONAL GUARD ARMORY	IL	Complete
FUSRAP	NEW BRUNSWICK SITE	NJ	
FUSRAP	NIAGARA FALLS STORAGE SITE	NY	
FUSRAP	NIAGARA FALLS STORAGE SITE VICINITY PROPERTIES	NY	Complete
FUSRAP	PAINESVILLE	OH	
FUSRAP	SEAWAY INDUSTRIAL PARK	NY	
FUSRAP	SEYMOUR SPECIALTY WIRE	CT	Complete
FUSRAP	SHPACK LANDFILL	MA	
FUSRAP	ST. LOUIS AIRPORT SITE (SLAPS)	MO	
FUSRAP	ST. LOUIS AIRPORT SITE (VICINITY PROPERTIES)	MO	
FUSRAP	ST. LOUIS DOWNTOWN SITE (SLDS)	MO	
FUSRAP	UNIVERSITY OF CALIFORNIA	CA	Complete
FUSRAP	UNIVERSITY OF CHICAGO	IL	Complete
FUSRAP	VENTRON	MA	
FUSRAP	W.R. GRACE & COMPANY	MD	
FUSRAP	WAYNE	NJ	
HANFORD SITE (HANFORD)	100-BC-1	WA	
HANFORD	100-BC-2 (3&4)	WA	
HANFORD	100-BC-5	WA	
HANFORD	100-D PONDS	WA	
HANFORD	100-DR - (2 & 3)	WA	
HANFORD	100-DR-1	WA	
HANFORD	100-FR-1	WA	
HANFORD	100-FR-2	WA	
HANFORD	100-FR-3	WA	
HANFORD	100-HR-1	WA	
HANFORD	100-HR-2	WA	
HANFORD	100-HR-3	WA	
HANFORD	100-IU-1	WA	
HANFORD	100-IU-2	WA	
HANFORD	100-IU-3	WA	
HANFORD	100-IU-4	WA	
HANFORD	100-IU-5	WA	
HANFORD	100-KR-1	WA	
HANFORD	100-KR-2	WA	

Site Name	Project Name	State	Status
HANFORD	100-KR-4	WA	
HANFORD	100-NR-1	WA	
HANFORD	100-NR-2	WA	
HANFORD	1100-EM	WA	Complete
HANFORD	1301 N / 1325 N LIQUID WASTE DISPOSAL	WA	
HANFORD	1324 N / 1324 NA CLOSURES	WA	
HANFORD	183-H SOLAR BASIN (PU-1)	WA	
HANFORD	200 BP-7	WA	
HANFORD	200 EGW	WA	
HANFORD	200 IU-3	WA	
HANFORD	200 IU-4	WA	
HANFORD	200 IU-5	WA	
HANFORD	200 IU-6	WA	
HANFORD	200 PO-3	WA	
HANFORD	200 RO-4	WA	
HANFORD	200 TP-5	WA	
HANFORD	200 TP-6	WA	
HANFORD	200 UP-3	WA	
HANFORD	200 WGW	WA	
HANFORD	200-BP-1	WA	
HANFORD	200-BP-10	WA	
HANFORD	200-BP-11	WA	
HANFORD	200-BP-2	WA	
HANFORD	200-BP-3	WA	
HANFORD	200-BP-4	WA	
HANFORD	200-BP-5	WA	
HANFORD	200-BP-6	WA	
HANFORD	200-BP-8	WA	
HANFORD	200-BP-9	WA	
HANFORD	200-IU-1	WA	
HANFORD	200-IU-2	WA	
HANFORD	200-NO-1	WA	
HANFORD	200-PO-1	WA	
HANFORD	200-PO-2	WA	
HANFORD	200-PO-4	WA	
HANFORD	200-PO-5	WA	

Site Name	Project Name	State	Status
HANFORD	200-PO-6	WA	
HANFORD	200-RO-1	WA	
HANFORD	200-RO-2	WA	
HANFORD	200-RO-3	WA	
HANFORD	200-SO-1	WA	
HANFORD	200-SS-1	WA	
HANFORD	200-SS-2	WA	
HANFORD	200-TP-1	WA	
HANFORD	200-TP-2	WA	
HANFORD	200-TP-3	WA	
HANFORD	200-TP-4	WA	
HANFORD	200-UP-1	WA	
HANFORD	200-UP-2	WA	
HANFORD	200-ZP-1	WA	
HANFORD	200-ZP-2	WA	
HANFORD	200-ZP-3	WA	
HANFORD	216-A-10 CRIB (PU-6)	WA	
HANFORD	216-A-29 DITCH (PU-9)	WA	
HANFORD	216-A-36B CRIB (PU-8)	WA	
HANFORD	216-B-63 TRENCH	WA	
HANFORD	216-S-10 POND & DITCH	WA	
HANFORD	216-U-12 (PU-7)	WA	
HANFORD	300 PROCESS TRENCHES (PU-5)	WA	
HANFORD	300-FF-1	WA	
HANFORD	300-FF-2 (FF-3, FF-4, IU-1)	WA	
HANFORD	300-FF-5	WA	
HANFORD	B POND (PU 3)	WA	
HANFORD	HEXONE TANKS (PU-4)	WA	
HANFORD	NRDWL (PU-2)	WA	
HANFORD	RARA	WA	
HANFORD	SST CLOSURES	WA	
HANFORD	UST	WA	
IDAHO NATIONAL ENGINEERING LABORATORY (INEL)	OU 1-01 (MISC SITES)	ID	Complete
INEL	OU 1-02 (TANK SITES)	ID	Complete
INEL	OU 1-03 (SOIL CONTAMINATION)	ID	
INEL	OU 1-04 (7 ACID/CAUSTIC SITES)	ID	

Site Name	Project Name	State	Status
INEL	OU 1-05 (RADIOACTIVE CONTAMINATED SITES)	ID	
INEL	OU 1-06 (TSF DISPOSAL POND)	ID	
INEL	OU 1-07A (TSF INJECTION WELL)	ID	
INEL	OU 1-07B (TAN GROUNDWATER)	ID	
INEL	OU 1-08 (3 METAL CONTAMINATED SITES)	ID	
INEL	OU 1-09 (SOIL CONTAMINATED SITES)	ID	
INEL	OU 1-10 (COMP RI/FS)	ID	
INEL	OU 10-01 (LOD CORROSIVE CHEM DISP AREA - LCCDA, & LIMESTONE PIT	ID	
INEL	OU 10-02 (ORGANIC MODERATOR REACTOR EXPERIMENT (OMRE) LEACH POND	ID	
INEL	OU 10-03 (ORDNANCE AREAS)	ID	
INEL	OU 10-04 (COMP RI/FS SNAKE RIVER PLAIN AQUIFER)	ID	
INEL	OU 10-05 RAD SOILS	ID	
INEL	OU 2-01 (PAINT SHOP AREA)	ID	Complete
INEL	OU 2-02 (PETROLEUM UST)	ID	Complete
INEL	OU 2-03 (MISC. SPILLS)	ID	Complete
INEL	OU 2-04 (FUEL SPILLS)	ID	
INEL	OU 2-05 (HOT WASTE TANKS)	ID	
INEL	OU 2-06 (RUBBLE PILES)	ID	Complete
INEL	OU 2-07 (COOLING TOWERS)	ID	
INEL	OU 2-08 (MTR CANAL)	ID	
INEL	OU 2-09 (COLD WASTE POND/SEWAGE SYSTEM)	ID	
INEL	OU 2-10 (WARM WASTE POND)	ID	
INEL	OU 2-11 (RETENTION BASIN & INJECTION WELL)	ID	Complete
INEL	OU 2-12 (PERCHED WATER)	ID	Complete
INEL	OU 2-13 (COMP RI/FS)	ID	
INEL	OU 3-01 (PCB RELEASES)	ID	Complete
INEL	OU 3-02 (CHEMICAL DISPOSAL SITES)	ID	Complete
INEL	OU 3-03 (ICPP PERCOLATION PONDS)	ID	
INEL	OU 3-04 (ASBESTOS)	ID	Complete
INEL	OU 3-05 (SEWAGE TREATMENT PLANT)	ID	
INEL	OU 3-06	ID	
INEL	OU 3-07 (TANK FARM AREA I)	ID	Complete
INEL	OU 3-08 (TANK FARM AREA II)	ID	Complete

Site Name	Project Name	State	Status
INEL	OU 3-09 (CPP-603 AREA)	ID	
INEL	OU 3-10 (CHEMICAL DISPOSAL SITE I)	ID	
INEL	OU 3-11 (CHEMICAL DISPOSAL SITE II)	ID	
INEL	OU 3-12 (NEW UNITS)	ID	Complete
INEL	OU 3-13 (COMP RI/FS)	ID	
INEL	OU 4-02 (CFA DRY WELLS)	ID	
INEL	OU 4-03 (UST AREA)	ID	
INEL	OU 4-04 (CFA DRUM STORAGE AREA)	ID	
INEL	OU 4-05 (CFA-679 POND & FIRE DEPT. TRAIN AREA)	ID	
INEL	OU 4-06 (LEAD SHOP)	ID	
INEL	OU 4-07 (FRENCH DRAINS)	ID	
INEL	OU 4-08 (CFA SEWAGE SYSTEM)	ID	
INEL	OU 4-09 (SPILL AREAS)	ID	
INEL	OU 4-11 (CFA MOTOR POOL POND)	ID	Complete
INEL	OU 4-12 (CFA LANDFILL 2&3)	ID	
INEL	OU 4-13 (COMP RI/FS)	ID	
INEL	OU 5-01 (ARA 1 POND, DRAIN, TANKS)	ID	
INEL	OU 5-02 (SPERT PONDS)	ID	
INEL	OU 5-03 (PBF BLOW DOWN PITS)	ID	Complete
INEL	OU 5-04 (SPERT FUEL OIL TANKS)	ID	
INEL	OU 5-05 (SL-1 BURIAL GROUND)	ID	

Site Name	Project Name	State	Status
INEL	OU 5-06 (ARA III RAD LEACH POND & ARA IV LEACH PIT 1)	ID	
INEL	OU 5-07 (ARA-I SANITARY SEWER SYSTEM & PAD)	ID	Complete
INEL	OU 5-08 (PBF INJECTION WELL & SPERT SEEPAGE PIT)	ID	
INEL	OU 5-09 (PBF SPERT LEACH PONDS)	ID	
INEL	OU 5-10 (ARA I CHEMICAL EVAPORATION POND)	ID	Complete
INEL	OU 5-11 (ARA III SANITARY SEWER)	ID	Complete
INEL	OU 5-12 (COMP RI/FS)	ID	
INEL	OU 5-13 (PBF AREA POND & SUMP)	ID	Complete
INEL	OU 6-02 (MISC. SITES)	ID	Complete
INEL	OU 6-03 (UST AREA)	ID	
INEL	OU 6-04 (EBR-1 RAD SOIL)	ID	
INEL	OU 7-01 (SDA SOIL VAULTS)	ID	
INEL	OU 7-02 (SDA ACID PIT)	ID	Complete
INEL	OU 7-03 (NON-TRU PITS & TRENCHES)	ID	Complete
INEL	OU 7-04 (RWMC-AIR)	ID	
INEL	OU 7-05 (SURFACE WATER & SEDIMENTS)	ID	Complete
INEL	OU 7-06 (GROUNDWATER)	ID	
INEL	OU 7-07 (VADOSE ZONE RAD/METALS)	ID	
INEL	OU 7-08 (VADOSE ZONE VOCS)	ID	
INEL	OU 7-09 (TRU STORAGE AREA RELEASE)	ID	Complete
INEL	OU 7-10 (PIT 9)	ID	
INEL	OU 7-11 (SEPTIC TANKS)	ID	Complete
INEL	OU 7-12 (PAD A)	ID	Complete
INEL	OU 7-13 (TRU WASTE PITS & TRENCHES)	ID	
INEL	OU 7-14 (COMP RI/FS)	ID	
INEL	UNDERGROUND STORAGE TANKS	ID	Complete
INHALATION TOXICOLOGY RESEARCH INSTITUTE (ITRI)	DIESEL OIL REMEDIATION	NM	Complete
ITRI	GROUNDWATER AND SANITARY LAGOONS	NM	
ITRI	HOT PONDS REMEDIATION	NM	Complete
K-25 SITE (K-25)	GROUNDWATER PROTECTION	TN	
K-25	K 901 - FORMERLY AREA 10	TN	
K-25	K-1004 SOURCE OU	TN	
K-25	K-1007 SOURCE OU	TN	
K-25	K-1064 SOURCE OU	TN	
K-25	K-1401 SOURCE OU	TN	

Site Name	Project Name	State	Status
K-25	K-1407 SOURCE OU	TN	
K-25	K-1407-B HOLDING POND RCRA CLOSURE	TN	Complete
K-25	K-1407-C RETENTION BASIN RCRA CLOSURE	TN	Complete
K-25	K-1410 SOURCE OU	TN	
K-25	K-1413 SOURCE OU	TN	
K-25	K-1414 GARAGE LEAKING UST	TN	Complete
K-25	K-1417 BLOCK CASTING/STORAGE AREA RCRA CLOSURE	TN	
K-25	K-1419 SLUDGE FIXATION PLANT RCRA CLOSURE	TN	
K-25	K-1420 SOURCE OU	TN	
K-25	K-25 SOURCE OU	TN	
K-25	K-29 SOURCE OU	TN	
K-25	K-33 SOURCE OU	TN	
K-25	K-770 SOURCE OU	TN	
K-25	POND WASTE MANAGEMENT DRUM REPACKAGING	TN	Complete
K-25	POND WASTE TREATMENT	TN	
K-25	STUDY AREA K-1232 CHEMICAL RECOVERY FACILITY	TN	
K-25	STUDY AREAS	TN	
K-25	STUDY AREAS	TN	
K-25	UST ASSESSMENT, REMOVAL & REMEDIATION	TN	
KANSAS CITY PLANT (KCP)	ABANDONED INDIAN CREEK OUTFALL	MO	Complete
KCP	DEPARTMENT 26	MO	
KCP	DEPARTMENT 27 INSIDE	MO	
KCP	DEPARTMENT 27 INTERIM MEASURES	MO	Complete
KCP	GROUNDWATER TREATMENT & MONITORING	MO	Complete
KCP	MAINTENANCE VEHICLE REPAIR SHOP SUMP	MO	
KCP	MISCELLANEOUS CONTAMINATED SITES	MO	
KCP	MISCELLANEOUS PCB SITES INTERIM MEASURES	MO	
KCP	OUTFALL 001 / NORTHEAST AREA	MO	
KCP	PLATING BUILDING	MO	
KCP	RCRA SOUTH LAGOON CLOSURE (CAPPING)	MO	Complete
KCP	SOUTH LAGOON GROUNDWATER	MO	
KCP	TCE STILL AREA SOILS	MO	
LAB. FOR ENERGY RELATED HEALTH RESEARCH (LEHR)	GROUNDWATER	CA	

Site Name	Project Name	State	Status
LEHR	SOIL	CA	
LAWRENCE BERKELEY LABORATORY (LBL)	HAZARDOUS WASTE HANDLING FACILITY	CA	
LBL	SOIL AND GROUNDWATER	CA	
LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL)	BLDG 612	CA	
LLNL	CLOSURE PITS 1 & 7	CA	Complete
LLNL	HE BURN PITS	CA	
LANL (LLNL)	MAIN SITE RA	CA	
LANL (LLNL)	SITE 300 OU1	CA	
LANL (LLNL)	SITE 300 OU2	CA	
LANL (LLNL)	SITE 300 OU3	CA	
LANL (LLNL)	SITE 300 OU4	CA	
LANL (LLNL)	SITE 300 OU5, CLOSURE PITS 3 & 5	CA	
LANL (LLNL)	SITE 300 OU6	CA	
LANL (LLNL)	SITE 300 REMEDIAL INVESTIGATION	CA	
LOS ALAMOS NATIONAL LABORATORY (LANL)	00-032 STORM WATER DRAIN	NM	Complete
LANL	01-003(d) CAN DUMP SITE	NM	Complete
LANL	03-003(p) TRANSFORMER STORAGE	NM	Complete
LANL	03-047(d) DRUM STORAGE	NM	Complete
LANL	03-051(c) VACUUM PUMP EXHAUST	NM	Complete
LANL	06-007(f) SURFACE DISPOSAL	NM	Complete
LANL	06-003(a) SEPTIC TANK	NM	Complete
LANL	09-010(a) METAL STORAGE STRUCTURE	NM	Complete
LANL	09-010(b) METAL STORAGE STRUCTURE	NM	Complete
LANL	16-011 INCINERATOR CAGE	NM	Complete
LANL	16-016(b) SURFACE DISPOSAL	NM	Complete
LANL	16-016(f) SURFACE DISPOSAL	NM	Complete
LANL	18-001(a) LAGOONS	NM	Complete
LANL	18-003(a) SEPTIC SYSTEM	NM	Complete
LANL	18-002 SURFACE DISPOSAL AREA	NM	Complete
LANL	20-003(c) FIRING SITE	NM	Complete
LANL	21-002(j) SUMP	NM	Complete
LANL	21-013(c) SURFACE DISPOSAL	NM	Complete
LANL	21-013(d) SURFACE DISPOSAL	NM	Complete

Site Name	Project Name	State	Status
LANL	21-013(a) SURFACE DISPOSAL	NM	Complete
LANL	21-024(b) SEPTIC SYSTEM TANK	NM	Complete
LANL	21-024(d) SEPTIC SYSTEM OUTFALL	NM	Complete
LANL	21-024(e) SEPTIC SYSTEM OUTFALL	NM	Complete
LANL	21-024(h) SEPTIC SYSTEM OUTFALL	NM	Complete
LANL	31-001 SEPTIC SYSTEM OUTFALL	NM	Complete
LANL	33-016 SUMP WITH OUTFALL	NM	Complete
LANL	39-002(a) STORAGE AREA	NM	Complete
LANL	39-002(c) WASTE CONTAINER STORAGE AREA	NM	Complete
LANL	39-007(a) WASTE CONTAINER STORAGE AREA	NM	Complete
LANL	48-002(a) WASTE CONTAINER STORAGE AREA	NM	Complete
LANL	48-002(b) WASTE CONTAINER STORAGE AREA	NM	Complete
LANL	53-010 CONTAINER STORAGE AREA	NM	Complete
LANL	57-006 BURIED VESSEL	NM	Complete
LANL	C-00-036(a) BORROW PIT #1	NM	Complete
LANL	C-00-036(b) BORROW PIT #2	NM	Complete
LANL	C-00-036(c) BORROW PIT #3	NM	Complete
LANL	C-00-036(d) BORROW PIT #4	NM	Complete
LANL	C-00-041 TAR DISPOSAL	NM	Complete
LANL	C-09-001 OIL STAIN	NM	Complete
LANL	C-10-001 RAD CONTAMINATED DIRT	NM	Complete
LANL	C-21-027 COOLING TOWER	NM	Complete
LANL	C-36-001 CONTAMINATED VESSEL	NM	Complete
LANL	TA-35 WASTE OIL STG. PIT REMEDIATION	NM	Complete
LANL	TA-40 SCRAP DENOTATION CLOSURE	NM	Complete
LANL	WAG 1	NM	
LANL	WAG 2	NM	
LANL	WAG 3	NM	
LANL	WAG 4	NM	
LANL	WAG 5	NM	
MONTICELLO REMEDIAL ACTION PROJECT	MONTICELLO REMEDIATION ACTION PROJECT	UT	

Site Name	Project Name	State	Status
(MONTICELLO)			
MONTICELLO	MONTICELLO SURF./GROUNDWATER REMEDIATION	UT	
MONTICELLO	MONTICELLO VICINITY PROPERTIES	UT	
MOUND PLANT	OU1 AREA B GROUNDWATER	OH	
MOUND PLANT	OU2 MAIN HILL SEEPS	OH	
MOUND PLANT	OU4 MIAMI-ERIE CANAL	OH	
MOUND PLANT	OU5 RAD. CONTAMINATED SOILS	OH	
MOUND PLANT	OU6 D&D SITES HAZARDOUS CONSTITUENTS	OH	
MOUND PLANT	OU9 SITEWIDE RI/FS	OH	
NEVADA OFFSITE LOCATIONS (NEVADA)	AMCHITKA ISLAND	AK	
NEVADA	CENTRAL NEVADA TEST SITE (CNTS)	NV	
NEVADA	DRILLING MUD PITS (CNTS)	NV	
NEVADA	GASBUGGY	NM	
NEVADA	GNOME-COACH	NM	
NEVADA	MISSISSIPPI REMEDIAL ACTIONS	MS	
NEVADA	PROJECT CHARIOT	AK	Complete
NEVADA	RIO BLANCO	CO	
NEVADA	RULISON	CO	
NEVADA	SAFER CLOSURE 5 POINT LANDFILL (TTR)	NV	Complete
NEVADA	SAFER CLOSURE DOUBLE TRACKS (TTR) (EQUIPMENT)	NV	
NEVADA	SHOAL SITE	NV	
NEVADA TEST SITE (NTS)	ABANDONED SEPTIC TANKS	NV	

Site Name	Project Name	State	Status
NTS	ACTIVE TUNNELS (N,P, & T) AND MUCKPILES & PONDS	NV	
NTS	AREA 2 BIT CUTTER SHOP AND INJECTION WELL	NV	
NTS	AREA 23 BLDG 650 LEACHFIELDS	NV	
NTS	AREA 23 LANDFILL WASTE TRENCHES	NV	Complete
NTS	AREA 27 EXPLOSIVE ORDNANCE DISPOSAL SITE (EOD)	NV	Complete
NTS	AREA 6 DECONTAMINATION POND	NV	
NTS	AREA 6 STEAM CLEANING EFFLUENT POND	NV	
NTS	ATMOSPHERIC TESTING DEBRIS DISPOSAL (ATDD)	NV	
NTS	CONTAMINATED WASTE SITES (CWS)	NV	
NTS	GROUNDWATER CHARACTERIZATION PROJECT	NV	
NTS	INACTIVE LEACHFIELDS	NV	
NTS	INACTIVE MUCK PILES AND TUNNELS	NV	
NTS	INACTIVE STORAGE TANKS	NV	
NTS	OTHER CERCLA INDUSTRIAL SITES	NV	Complete
NTS	PLUTONIUM SOILS	NV	
NTS	SUMP AND INJECTION WELL REMEDIATION	NV	
NTS	SUMPS (POST EVENT LOCATIONS)	NV	
NTS	U2BU CRATER	NV	
NTS	U3FI INJECTION WELL	NV	
NTS	UNDERGROUND STORAGE TANKS	NV	
OAK RIDGE ASSOCIATED UNIVERSITIES (ORAU)	FREELS BEND AREA OU	TN	Complete
ORAU	SOUTH CAMPUS FACILITY	TN	
OAK RIDGE NATIONAL LABORATORY (ORNL)	CESIUM PLOTS OU	TN	Complete
ORNL	HYDROFACTURE WELL P&A	TN	
ORNL	INACTIVE LLLW LINE	TN	
ORNL	MONITORING STATION CONSTRUCTION	TN	Complete
ORNL	NORTH & SOUTH TANK FARM TREATABILITY STUDIES	TN	
ORNL	NORTH & SOUTH TANK FARMS	TN	
ORNL	NTF AND STF TANKS TH-4 AND W-11	TN	
ORNL	OU-1 GROUT SHEETS	TN	
ORNL	OU-1 SUBSURFACE DISPOSAL	TN	
ORNL	OU-2 GROUNDWATER	TN	
ORNL	OU-2 PIPELINE LEAK SITES/SURFACE SURFACE CONTAMINATION	TN	

Site Name	Project Name	State	Status
ORNL	PIPELINES AND TRENCHES	TN	
ORNL	PRIMARY SOURCES (SWSA 4)	TN	
ORNL	SEEPAGE PIT #1 ISV DEMONSTRATION	TN	
ORNL	STORAGE CANAL AT BLD 3001 CLOSURE	TN	Complete
ORNL	STORAGE CANAL AT BLDG 3001 CLOSURE	TN	Complete
ORNL	STORAGE TANK NEAR BLDG 7860 CLOSURE	TN	Complete
ORNL	SURFACE IMPOUNDMENTS	TN	
ORNL	SWSA 4 GROUNDWATER/SEEPS	TN	
ORNL	TANKS NEAR BLD 7860 & CLOSURE OF TANKS 4501-C AND 4501-D	TN	Complete
ORNL	TUMULUS PAD CLOSURE	TN	Complete
ORNL	WAG 1 CORE HOLE 8	TN	
ORNL	WAG 5 GROUNDWATER SEEPS	TN	Complete
ORNL	WAG 6 PRIMARY SOURCES	TN	
ORNL	WASTE AREA GROUPING 11 SOILS & SUBSURFACE CONTAMINATION	TN	
ORNL	WASTE AREA GROUPING 13	TN	
ORNL	WASTE AREA GROUPING 2	TN	
ORNL	WASTE AREA GROUPING 3	TN	
ORNL	WASTE AREA GROUPING 6	TN	
ORNL	WASTE AREA GROUPING 8	TN	
ORNL	WASTE AREA GROUPING 9	TN	
ORNL	WELL PLUGGING AND ABANDONMENT	TN	Complete
OAK RIDGE RESERVATION (ORR)	ATOMIC CITY AUTO PARTS (ACAP) PHASE I	TN	Complete
ORR	ATOMIC CITY AUTO PARTS PHASE II	TN	
ORR	CLINCH RIVER / LOWER WATTS BAR	TN	
ORR	CLINCH RIVER / POPLAR CREEK	TN	
ORR	CSX RAILROAD	TN	Complete
ORR	DAVID WITHERSPOON INC (901 AREA ONLY)	TN	Complete
ORR	EAST FORK POPLAR CREEK	TN	
ORR	SOLWAY DRUM SITE	TN	Complete
ORR	WHITE OAK CREEK EMBAYMENT	TN	Complete
PADUCAH GASEOUS DIFFUSION PLANT (PADUCAH)	C-750-C	KY	Complete
PADUCAH	OFFSITE GW WAG 22 BURIAL GROUND	KY	
PADUCAH	OFFSITE GW WAG 23 PCB SITES	KY	
PADUCAH	OFFSITE NE PLUME SOURCE CONTAINMENT	KY	
PADUCAH	OFFSITE NW PLUME HIGH CONCENTRATION PORTION	KY	

Site Name	Project Name	State	Status
PADUCAH	OFFSITE NW PLUME SOURCE CONTAINMENT	KY	Complete
PADUCAH	UNDERGROUND STORAGE TANKS	KY	
PADUCAH	WAG 13 SWMU 138	KY	
PADUCAH	WAG 17	KY	
PADUCAH	WAG 18	KY	
PADUCAH	WAG 6	KY	
PADUCAH	WAGS 1&7, SWMU-94,95	KY	
PADUCAH	WAGS 10,16	KY	
PADUCAH	WAGS 12&15	KY	
PADUCAH	WAGS 2,3 & 14	KY	
PADUCAH	WAGS 5&11	KY	
PADUCAH	WAGS 8,9	KY	
PANTEX PLANT (PANTEX)	BURNING GROUND	TX	
PANTEX	CHEMICAL RELEASES	TX	
PANTEX	CONSTRUCTION LANDFILLS	TX	
PANTEX	FIRE DEPT. BURN PITS	TX	
PANTEX	FIRING SITES	TX	
PANTEX	FORMER COOLING TOWER	TX	
PANTEX	HIGH EXPLOSIVE/RAD. SITES	TX	
PANTEX	HYPALON POND	TX	
PANTEX	LEAKING UNDERGRD STORAGE TANKS	TX	
PANTEX	OLD SEWAGE TREATMENT PLANT	TX	
PANTEX	ONSITE PLAYAS AND DITCHES	TX	
PANTEX	PRIORITY RECONNAISSANCE SITES	TX	
PANTEX	SUPPLEMENTAL SITES	TX	
PANTEX	UNDERGROUND STORAGE TANKS	TX	
PANTEX	ZONE 12 NORTH GROUNDWATER	TX	
PINELLAS PLANT (PINELLAS)	4.6 ACRE SITE	FL	
PINELLAS	FLORIDIAN AQUIFER	FL	Complete
PINELLAS	FORMER PISTOL RANGE	FL	Complete
PINELLAS	MISCELLANEOUS SITES (ALL NFA SITES)	FL	Complete
PINELLAS	PEAK OIL PRP PARTICIPATION	FL	Complete
PINELLAS	SLUDGE HOLDING TANK	FL	Complete
PORTSMOUTH GASEOUS DIFFUSION PLANT (PORTS)	X-735 LANDFILL	OH	Complete
PORTS	GROUNDWATER PROTECTION	OH	
PORTS	QUADRANT I	OH	

Site Name	Project Name	State	Status
PORTS	QUADRANT I/X-749 PHASE II (PHASE I)	OH	
PORTS	QUADRANT II	OH	
PORTS	QUADRANT II/X-705A 1B (PHASE 1)	OH	
PORTS	QUADRANT III	OH	
PORTS	QUADRANT IV	OH	
PORTS	QUADRANT IV/X-611A "WETLANDS"	OH	
PORTS	UNDERGROUND/ABOVEGROUND STORAGE TANKS	OH	Complete
PORTS	X-23057	OH	
PORTS	X-231B BIODEGRATION PLOT	OH	
PORTS	X-344A	OH	Complete
PORTS	X-616 CHROMIUM SLUDGE LAGOON	OH	Complete
PORTS	X-701B HOLDING POND	OH	
PORTS	X-701C	OH	
PORTS	X-740 FACILITY	OH	Complete
PORTS	X-740 TANK	OH	Complete
PORTS	X-744 Y WASTE SORTING	OH	
PORTS	X-744G(R) FACILITY	OH	Complete
PORTS	X-744G(U) FACILITY	OH	Complete
PORTS	X-744Y YARD	OH	Complete
PORTS	X-749 NORTH	OH	Complete
PORTS	X-749 SOUTH	OH	Complete
PORTS	X-749A	OH	Complete
PORTS	X-750 TANK	OH	Complete
PORTS	X-752 FACILITY	OH	Complete
PRINCETON PLASMA PHYSICS LABORATORY (PPPL)	CERCLA INVENTORY	NJ	Complete
PPPL	GRNDWTR CHARACT/REMEDIATION	NJ	
RMI SITE (RMI)	FIELDS BROOK	OH	
RMI	GROUNDWATER	OH	
ROCKY FLATS PLANT (RFP)	ONSITE/OFFSITE WATER MANAGEMENT	CO	
RFP	OU1, 881 HILLSIDE	CO	
RFP	OU10, OTHER OUTSIDE CLOSURES	CO	
RFP	OU11, WEST SPRAY FIELDS	CO	
RFP	OU12, 400/800 AREA	CO	
RFP	OU13, 100 AREA	CO	
RFP	OU14, RADIOACTIVE SITES	CO	
RFP	OU15, INSIDE BUILDING CLOSURES	CO	

Site Name	Project Name	State	Status
RFP	OU16, LOW PRIORITY SITES	CO	
RFP	OU2, 903 PAD, MOUND, EAST TRENCH	CO	
RFP	OU3, OFFSITE AREAS	CO	
RFP	OU4, SOLAR PONDS	CO	
RFP	OU5, WOMAN CREEK	CO	
RFP	OU6, WALNUT CREEK	CO	
RFP	OU7, PRESENT LANDFILL	CO	
RFP	OU8, 700 AREA	CO	
RFP	OU9, ORIGINAL PROCESS WASTE LINES	CO	
SANDIA NATIONAL LABORATORY-ALBUQUERQUE (SNL/NM)	CANYONS TEST AREA	NM	
SNL/NM	CAPE CANAVERAL	FL	
SNL/NM	CENTRAL COYOTE TEST AREA	NM	
SNL/NM	CHEMICAL WASTE LANDFILL	NM	
SNL/NM	EDGEWATER TEST SITE REMEDIATION	MD	
SNL/NM	FOOTHILLS TEST AREA	NM	
SNL/NM	HOLLOMON AFB	NM	
SNL/NM	KAUAI TEST FACILITY	HI	
SNL/NM	KIRTLAND AFB	NM	
SNL/NM	LEAKING UNDERGROUND STORAGE TANKS	NM	
SNL/NM	LIQUID WASTE DISPOSAL SYSTEM	NM	
SNL/NM	MIXED WASTE LANDFILL	NM	
SNL/NM	PAGANO SALVAGE YARD	NM	Complete
SNL/NM	SALTON SEA TEST BASE	CA	
SNL/NM	SEPTIC TANKS & DRAINS	NM	
SNL/NM	SOUTHWEST TEST AREA	NM	
SNL/NM	TECH AREAS 3&5	NM	
SNL/NM	TECHNICAL AREA 1	NM	
SNL/NM	TECHNICAL AREA 2	NM	
SNL/NM	TIJERAS ARROYO REMEDIATION	NM	
SNL/NM	TONOPAH TEST RANGE AREA	NV	
SNL/NM	WHITE SANDS MISSILE RANGE	NM	
SANDIA NATIONAL LABORATORIES-LIVERMORE (SNL/CA)	FUEL OIL REMEDIATION	CA	
SNL/CA	MISC. SITE REMEDIATION	CA	Complete
SNL/CA	NAVY LANDFILL REMEDIATION	CA	
SNL/CA	TRUDELL CLEAN-UP AND CLOSURE	CA	Complete

Site Name	Project Name	State	Status
SANTA SUSANA FIELD LABORATORY (SSFL)	BLDG 056 LANDFILL	CA	
SSFL (SSFL)	BLDG 100 TRENCH	CA	
SSFL (SSFL)	GROUNDWATER (SITEWIDE)	CA	
SSFL (SSFL)	SODIUM DISPOSAL FACILITY	CA	Complete
SSFL (SSFL)	SOIL SITEWIDE	CA	
SAVANNAH RIVER SITE (SRS)	105-C TANK CLOSURE	SC	Complete
SRS	105-C TANK NO ACTION ROD	SC	Complete
SRS	108-4R OVER FLOW BASIN	SC	
SRS	3/700 AREA GROUNDWATER	SC	
SRS	400 AREA GROUNDWATER	SC	
SRS	600 AREA GROUNDWATER	SC	
SRS	716-A MOTOR SEEPAGE BASIN	SC	
SRS	904-A TRENCH	SC	
SRS	A,C,D,F,H,K,P AREAS COAL PILE RUNOFF	SC	
SRS	A-AREA RUBBLE PILE	SC	
SRS	A-AREA RUBBLE PIT (731-2A)	SC	
SRS	AREA A BURNING RUBBLE PIT (131-A/1A)	SC	
SRS	BINGHAM PUMP OUTAGE PITS	SC	
SRS	BRAGG BAY / CEMETARY ROAD	SC	
SRS	BURIAL GROUND COMPLEX	SC	
SRS	BURMA ROAD RUBBLE PITS	SC	
SRS	C AREA ASH PILE	SC	
SRS	C-REACTOR BURNING RUBBLE PIT (131-C)	SC	
SRS	CENTRAL SHOPS BURNING RUBBLE PIT (631-6G)	SC	
SRS	CENTRAL SHOPS BURNING RUBBLE PITS (631-1G+3G)	SC	
SRS	CENTRAL SHOPS BURNING RUBBLE PITS (631-5G)	SC	
SRS	CENTRAL SHOPS SLUDGE LAGOON	SC	
SRS	CERCLA BASIN R	SC	
SRS	CERCLA BASIN R	SC	
SRS	CMP PITS	SC	
SRS	COMPREHENSIVE GROUNDWATER QUALITY ASSESSMENT & CORRECTIVE ACTION	SC	
SRS	D AREA ASH BASINS	SC	
SRS	D AREA BURNING RUBBLE PIT	SC	
SRS	F AREA SCRAP LUMBER PILE	SC	

Site Name	Project Name	State	Status
SRS	F&H AREA PROCESS SEWER LINES	SC	
SRS	F&H AREA SEEPAGE BASIN GROUNDWATER	SC	
SRS	F&H RETENTION BASINS	SC	
SRS	F-AREA BURNING RUBBLE PITS	SC	
SRS	FORD BUILDING	SC	
SRS	FORD BUILDING SEEPAGE BASIN	SC	
SRS	G AREA OIL SEEPAGE BASIN	SC	
SRS	GEORGIA FIELDS	SC	
SRS	GRACE ROAD	SC	Complete
SRS	GUNSITE 113 ACCESS ROAD	SC	
SRS	GUNSITE 218	SC	
SRS	GUNSITE 720	SC	
SRS	HYDROFLUORIC ACID SPILL	SC	
SRS	K-AREA RUBBLE PILE	SC	
SRS	K-AREA SLUDGE LAND APPLICATION SITE	SC	
SRS	K-REACTOR BURNING RUBBLE PIT (131-K)	SC	
SRS	K-REACTOR SEEPAGE BASIN	SC	
SRS	L-AREA OIL/CHEMICAL BASIN	SC	
SRS	L-AREA RUBBLE PILE (131-3L)	SC	
SRS	L-AREA RUBBLE PIT (131-1L)	SC	
SRS	L-REACTOR BURNING RUBBLE PIT (131-L)	SC	
SRS	LOW LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY (LLRWDF)	SC	
SRS	M AREA SETTLING BASIN	SC	Complete
SRS	M AREA WEST	SC	
SRS	M-AREA PROCESS SEWER LINES	SC	
SRS	MET LAB BASIN / CAROLINA BAY	SC	
SRS	MISC. CHEMICAL BASINS/METAL BURN PITS	SC	
SRS	MISC. TRASH AT SNAPP	SC	
SRS	MIXED WASTE MANAGEMENT FACILITY	SC	
SRS	MIXED WASTE MANAGEMENT FACILITY (MWMF)	SC	Complete
SRS	NEW TNX SEEPAGE BASIN	SC	
SRS	NON-RADIOACTIVE BURIAL GROUNDS	SC	
SRS	OLD F-AREA SEEPAGE BASIN	SC	
SRS	OLD TNX SEEPAGE BASIN	SC	
SRS	P-REACTOR BURNING RUBBLE PIT	SC	
SRS	PAR POND SLUDGE LAND APPLICATION	SC	

Site Name	Project Name	State	Status
SRS	R AREA RUBBLE PIT	SC	
SRS	R-REACTOR BURNING RUBBLE PIT (131-R/1R)	SC	
SRS	R-REACTOR SEEPAGE BASIN	SC	
SRS	RCRA BASINS F, H, P, & K	SC	
SRS	RCRA BASINS F, H, P, & K	SC	
SRS	REACTOR AREAS GROUNDWATER	SC	
SRS	ROAD A CHEMICAL BASIN	SC	
SRS	RWBG SOLVENT TANKS	SC	
SRS	SILVERTON ROAD WASTE SITE	SC	
SRS	SRL GROUNWATER REMEDIATION	SC	
SRS	SRL OIL TEST SITE	SC	
SRS	SRL SEEPAGE BASINS	SC	
SRS	TANK 16	SC	
SRS	TANK 37	SC	
SRS	THX BURIAL GROUND	SC	
SRS	VADOSE ZONE REMEDIATION	SC	Complete
SOUTH VALLEY SUPERFUND SITE	SV SUPERFUND SITE REMEDIATION	NM	
SOUTHWESTERN AREA PROGRAMS	MAXEY FLATS DISPOSAL SITE	KY	
STANFORD LINEAR ACCELERATOR CENTER	OU 1 SOIL & GROUNDWATER	CA	
UMTRA - GROUND WATER	REMEDIAL ACTIONS	NM	
UMTRA - SURFACE (UMTRA/S)	AMBROSIA LAKE, NM	NM	Complete
UMTRA/S	BELFIELD, ND	ND	
UMTRA/S	BOWMAN, ND	ND	
UMTRA/S	CANONSBURG, PA	PA	Complete
UMTRA/S	DURANGO, CO	CO	Complete
UMTRA/S	EDGEMONT, SD	SD	Complete
UMTRA/S	FALLS CITY, TX	TX	Complete
UMTRA/S	GRAND JUNCTION, CO	CO	Complete
UMTRA/S	GREEN RIVER, UT	UT	Complete
UMTRA/S	GUNNISON, CO	CO	
UMTRA/S	LAKEVIEW, OR	OR	Complete
UMTRA/S	LOWMAN, ID	ID	Complete
UMTRA/S	MAYBELL, CO	CO	
UMTRA/S	MEXICAN HAT, UT	UT	
UMTRA/S	MONUMENT VALLEY, AZ	AZ	Complete
UMTRA/S	NATURITA, CO	CO	

Site Name	Project Name	State	Status
UMTRA/S	RIFLE - 1, CO	CO	
UMTRA/S	RIFLE - 2, CO	CO	
UMTRA/S	RIVERTON, WY	WY	Complete
UMTRA/S	SALT LAKE CITY, UT	UT	Complete
UMTRA/S	SHIPROCK, NM	NM	Complete
UMTRA/S	SLICK ROCK - 1, CO	CO	
UMTRA/S	SLICK ROCK - 2, CO	CO	
UMTRA/S	SPOOK, WY	WY	Complete
UMTRA/S	TUBA CITY, AZ	AZ	Complete
WELDON SPRING SITE (WSSRAP)	CHEMICAL PLANT (PART OF SITE OU)	MO	
WSSRAP	DISPOSAL FACILITY (PART OF SITE OU)	MO	
WSSRAP	QUARRY BULK WASTE OU	MO	
WSSRAP	QUARRY RESIDUALS OU	MO	
WSSRAP	RAFFINATE PITS (PART OF SITE OU)	MO	
WSSRAP	SITE GROUNDWATER OU	MO	
WSSRAP	VICINITY PROPERTIES (PART OF SITE OU)	MO	
Y-12 PLANT (Y-12)	BEAR CREEK BURIAL GROUND A (BCBG-A)	TN	Complete
Y-12	BEAR CREEK BURIAL GROUND C-WEST	TN	Complete
Y-12	BEAR CREEK BURIAL GROUND WALK IN PITS (WIP)	TN	Complete
Y-12	BLDG 9409-5 TANK STORAGE AREA RCRA CLOSURE	TN	
Y-12	CHESTNUT RIDGE SECURITY PITS (CRSP)	TN	Complete
Y-12	CHESTNUT RIDGE SEDIMENTS DISPOSAL BASINS (CRSDB)	TN	Complete
Y-12	GARAGE UNDERGROUND STORAGE TANK CLOSURE	TN	Complete
Y-12	INTERIM DRUM YARD RCRA CLOSURE	TN	
Y-12	KERR HOLLOW QUARRY	TN	Complete
Y-12	NEW HOPE POND (NHP)	TN	Complete
Y-12	OIL LANDFARM	TN	Complete
Y-12	OIL RETENTION PONDS	TN	Complete
Y-12	OU 1 BEAR CREEK BURIAL	TN	
Y-12	OU 1 GROUNDWATER & SUBSURFACE WATER	TN	
Y-12	OU 2 ABANDONED NITRIC ACID PIPELINE	TN	
Y-12	OU 2 FILLED COAL ASH POND AND MCCOY BRANCH	TN	
Y-12	OU 2 SPOIL AREA	TN	
Y-12	OU 3 FLOOD PLAIN & SEDIMENT	TN	

Site Name	Project Name	State	Status
Y-12	OU1 SECURITY PITS	TN	
Y-12	RUST FUEL FACILITY	TN	Complete
Y-12	S-3 PONDS	TN	Complete
Y-12	UEFPC RMPE TANKS	TN	
Y-12	UEFPC/RMPE PERMANANENT TREATMENT FACILITY	TN	
Y-12	UNITED NUCLEAR CORP. DISPOSAL SITE (UNC)	TN	Complete

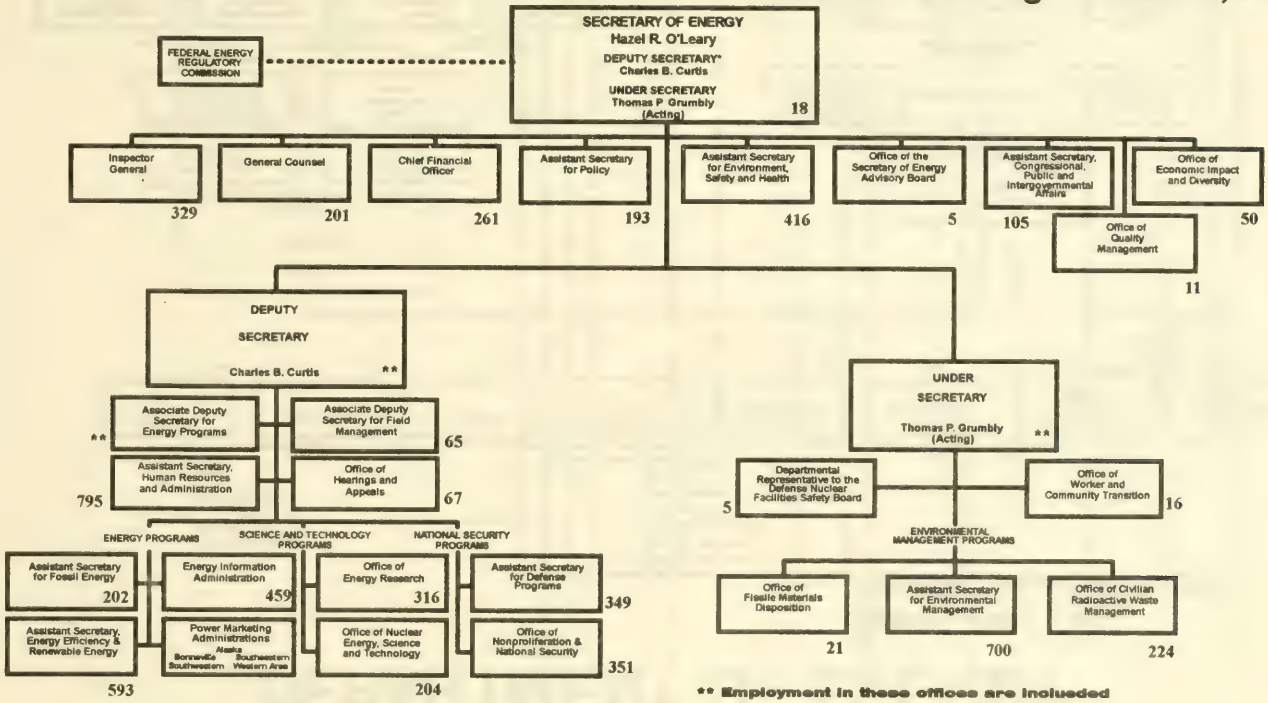
HEADQUARTERS ORGANIZATION CHART

Mr. Knollenberg. Will the Department please submit for the record a detailed organization chart for the entire Department of Energy, at office level, that includes a total head count for FY 1996 and FY 1997?

General Durham. Separate charts for fiscal years 1996 and 1997 are provided for the record. (The information follows:)

DEPARTMENT OF ENERGY

Fiscal Year 1996
Current staffing number: 5,956



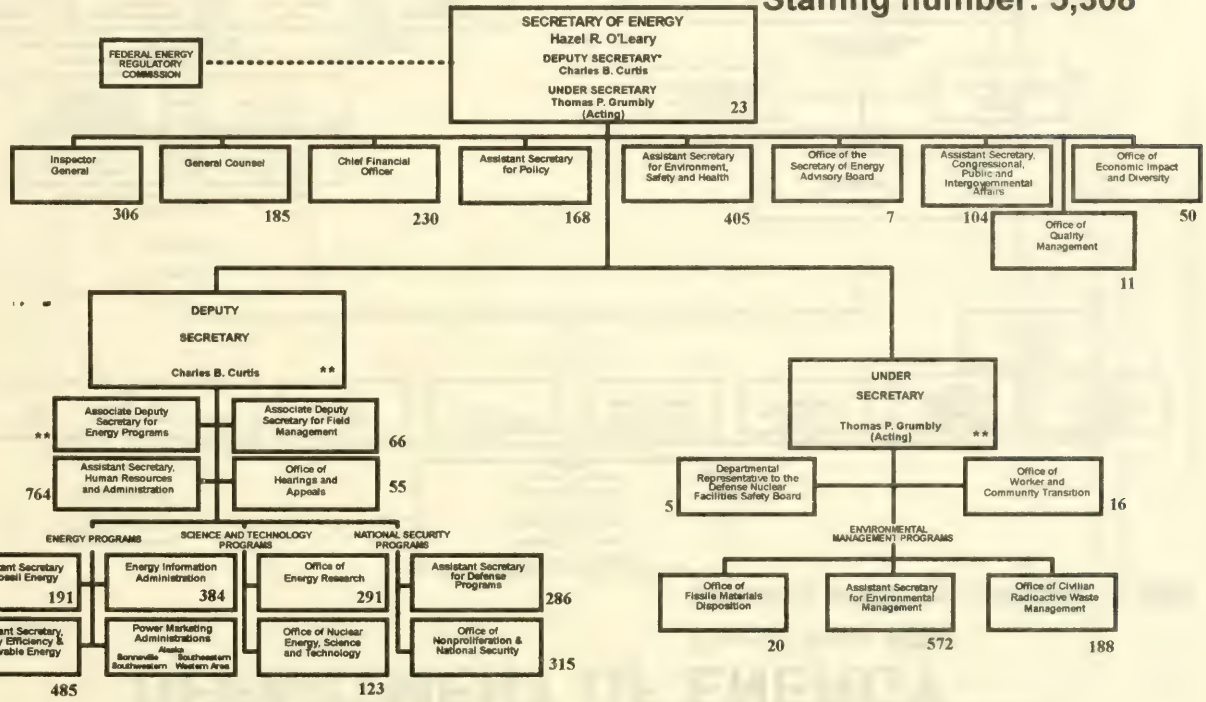
** Employment in these offices are included in the Office of the Secretary.

* Deputy Secretary serves as Chief Operating Officer of the Department

04/16/96

DEPARTMENT OF ENERGY

Fiscal Year 1997
Staffing number: 5,308



* Deputy Secretary serves as Chief Operating Officer of the Department

**Employment in these offices are included in the Office of the Secretary.

04/16/96

GEOTHERMAL

Mr. Riggs. I understand that the Budget request includes $2 million for the Lake County-Geysers Effluent Pipeline and Injection Project. Is this correct?

Mrs. Ervin. Yes, the Budget request includes $2 million for the Lake County-Geysers Effluent Pipeline and Injection Project.

Mr. Riggs. Do you believe this amount sufficient to complete this important California effort?

Mrs. Ervin. The amount should be sufficient to complete the project.

Mr. Riggs. I have been informed that, over the last few years, the Department has had to reduce budget line items by 15 to 20 percent. Has the FY 1996 Geysers Project funding been affected?

Mrs. Ervin. Yes. Of the $2 million budgeted for the project in FY 1996, the Department provided $1.7 million to the Lake County Sanitation District.

Mr. Riggs. Do you anticipate any reduction in the $2 million requested for the Geysers Project in FY 1997.

Mrs. Ervin. No I do not anticipate a reduction in FY 1997.

Mr. Riggs. What is the status of the Santa Rosa, California-Geysers feasibility study for which funds were included in the FY 1996 Department of Energy Appropriation Act?

Mrs. Ervin. The funds for the Santa Rosa, California-Geysers feasibility study have been transferred to the Department's Idaho Operations Office which will provide a grant to the City of Santa Rosa for the feasibility study. Idaho Operations Office is waiting for the City of Santa Rosa to supply certain essential information so that the Office can proceed with the grant.

HYDROGEN RESEARCH AND DEVELOPMENT

Mr. Riggs: The budget proposes a reduction of 24.1 percent in Hydrogen research from the FY 1996 enacted level of $14.5 million. Why is such a large decrease believed necessary?

Mrs. Ervin: The proposed reduction is consistent with the Department's FY 1997 budget request for the Office of Utility Technologies (OUT), which includes all renewable energy programs. OUT core R&D activities were essentially held constant at FY 1996 levels. For the Hydrogen Program, the Department's request of $11 million will maintain all of the core activities and longer-term technology verification activities. The Department did not request funds for any near-term technology verification activities for the Hydrogen Program, leading to a 24% reduction over the prior year's appropriation.

BIOFUELS ENERGY SYSTEMS

Mr. Riggs. The Conference Report on the FY 1996 Department of Energy Appropriation Act directed the Department to allocate $27.65 million for biochemical and thermochemical conversion under Biofuels Energy Systems. However, I understand that much of this money has been reapportioned to the biomass power program, leaving the biomass ethanol program at a much lower level than was directed by Congress. The biomass ethanol program can help reduce forest waste and wood residues that are of great concern to my constituents. Why have funds been cut, and what level of support for the biomass ethanol program is recommended in the FY 1997 Budget request.

Ms. Ervin.. The Administration's FY 1996 budget request for the biofuels program was $80.38 million, and represented one of the largest planned increases for any of the Department's renewable energy technology programs. The appropriation of $55.3 million, a 31 percent reduction, as well as the impact of a general reduction and other Congressional earmarks, required that the Department make difficult programmatic decisions. The FY1996 allocation of $19.61 million for biochemical conversion allows the Department to continue a balanced research, development, and demonstration activity that will lead to cost-effective production of ethanol, converting agricultural residues and forestry wastes in the near term and low-cost bioenergy crops in the long term. The level of support for the biomass ethanol program in the FY1997 budget request is $32.49 million that will again support a balanced program of research, development, and demonstration activities for the cost-effective production of ethanol, including cost-shared demonstrations of cellulosic biomass-to-ethanol technologies at one or more sites.

GEOTHERMAL

Mr. Riggs. Mr. Leon Ballew of Cobb, California, has contacted me about the need for additional loan guarantees that would enable small geothermal energy companies to better compete overseas. While he primarily discusses Small Business Administration programs, I would appreciate your reviewing Mr. Ballew's communication and provide information for the record on your Department's activities in this area and your reaction to his comments.

Ms. Ervin. The principal role of the Department in geothermal energy is the conduct of research and development in close cooperation with the U.S. geothermal industry, which shares the cost. At the direction of Congress, the Department established a program of loan guaranties to make development funds available at standard commercial rates. In the next several years, the Department competitively selected a number of projects that were financed at standard rates with the loans guaranteed by the Department. Of the nine loans guaranteed, five were successful repaid and four defaulted and the Department had to pay off the guarantees. Private lenders have had more success, however, and by the late 1980s, lenders were funding geothermal projects at standard rates. Mr. Ballew's observations about the present business dilemma of some small geothermal service companies is accurate. In recent years, competition from gas-generated electric power, sold at historically low rates, has stunted the growth of the domestic geothermal industry. Many of the larger geothermal companies have responded by seeking new business overseas where they have been able to compete successfully for electric power projects in those international markets where geothermal resources exist. However, many smaller companies, especially service companies, may enter into partnerships to gain the needed export expertise, contacts, and access to financeers.

ACCESS TO INFORMATION

Mr. Riggs. I have received a letter from Supervisors in Sonoma County, California, complaining about difficulty they are having obtaining public records from the Department of Energy. Will you please review this correspondence and respond for the record how you are going to address their concerns?

General Durham. The Department of Energy is not a party to the litigation between The Northern California Power Agency and the County of Sonoma, California. A review of our files found no record that the Department had received a subpoena for information related to the litigation, or that a request for documents was submitted to the Department by the County pursuant to the Freedom of Information Act. The records of interest to the County that are described in the correspondence to Mr. Riggs may contain information protected from public disclosure under the Freedom of Information Act and, therefore, may not be available to the public. The Department will search its files for the records and provide them in accordance with the Freedom of Information Act upon receipt of a request from the County. The County may submit the request to the Department's Freedom of Information Act Officer at Headquarters or the Oakland Operations Office.

LIST OF INDUSTRY GROUPS, TRADE ASSOCIATIONS, AND SIMILAR ORGANIZATIONS

Mr. Riggs. For the most recent year for which information is available, please provide for the record a list of all industry groups, trade associations and similar organizations that are receiving funds from the Department, including the amounts awarded to each.

Mr. Durham. Due to the great amount of information needed to respond to this request, we will provide a spreadsheet under separate cover.

GENERAL

Mr. Riggs. The City of Livermore has requested DOE assistance in its Greenville Road Improvement Project, which serves Lawrence Livermore National Laboratory. What is your position on this request?

Dr. Reis. It is the Department's policy to consider funding for public road work only if the road abuts land owned by the Department of Energy. Consistent with this policy, the Department of Energy provided a $1.8M grant to the City of Livermore in January 1993 for phase one of the Greenville Road Improvement Project. This portion of the project primarily involved safety improvements to the portion of Greenville road that abuts the Lawrence Livermore National Laboratory. The City has since requested additional funding totaling $7.8M to complete phases two and three of the project. These projects involve portions of Greenville Road that do not abut DOE owned property. The Manager, Oakland Operations Office, met with City of Livermore officials on January 25, 1995, and indicated that the Department could not fund phases two and three of the project, as originally proposed by the City. Additional assistance was not completely ruled out and the Department will continue to discuss this and other projects of mutual interest with the City of Livermore.

WARD VALLEY

Mr. Riggs. The Department of the Interior has requested further tests on the proposed Ward Valley low-level waste disposal site. Will DOE conduct these tests without concurrence of the State of California, which has licensed the Ward Valley site?

Admiral Guimond. The Department of Interior has inquired about the availability of DOE's Lawrence Livermore National Laboratory (LLNL) to perform tests. We have advised DOI that we have authority under the Economy Act and the Atomic Energy Act to perform these tests on a reimbursable basis and that LLNL has the capability. We further advised DOI that we need a clearly defined scope of work. DOI has indicated that it is looking for the funding necessary to have the work performed. We would not require the concurrence of the State of California to proceed with the work DOI has discussed with us.

WARD VALLEY

Mr. Riggs. Does DOE believe that its general authority to perfor work for the Interior Department under either the Economy Act or the Atomic Energy Act overrides its specific responsibility to assist the States under the Low-Level Radioactive Waste Policy Act?

Admiral Guimond. We do not see a conflict between those authorities.

WARD VALLEY

Mr Riggs. Does DOE intend to honor California's March 14, 1996, request to DOE for environmental monitoring assistance?

Admiral Guimond Consistent with our responsibility under LLRWPA, 42 U.S.C. § 2021g, to provide technical assistance to States developing new disposal facilities, we will discuss with California how we can cooperate on its recent request for environmental assistance. We would like to be helpful to California.

Mr. Riggs. Because California opposes the Interior Department's request, doesn't the State's request take precedence?

Admiral Guimond. No. However, we do not see either request as precluding us from providing assistance in response to the other.

WARD VALLEY

Mr. Riggs. Does DOE believe the tritium studies requested by the Interior would yield conclusive results regarding moisture and contaminant movement at the Ward Valley site?

Admiral Guimond. We do not want to prejudge the results before we have done analysis. Moreover, we have not discussed with DOI the precise nature of the analysis they would like LLNL to do.

Mr. Riggs. Are such tests the best method to address such questions at desert disposal sites?

Admiral Guimond. The National Academy of Sciences has expressed the view that a more complete knowledge of groundwater and radionuclide movement would be obtained by "additional analysis from tracers such as 36CL" than from tritium tests. However, as noted above, we have not discussed with DOI the precise type of testing it wants LLNL to perform.

Mr. Riggs. What experts were consulted in arriving at these judgments?

Admiral Guimond. DOE has not made a judgment about the best method of testing moisture and contaminant movement at Ward Valley. DOE is aware that Mr. Jay Davis, Associate Director of Environmental Programs at LLNL stated that tritium is not a good measure of moisture infiltration in arid regions and that experts from the NAS, the State of California and its contractors have concluded that tritium testing by itself does not provide conclusive results in these matters.

WARD VALLEY

Mr. Riggs. Does DOE believe that the National Academy of Sciences erred in concluding that additional tritium tests could be conducted during construction and operation, rather than requiring them prior to a land transfer decision?

Admiral Guimond. We have no technical basis to disagree with the NAS finding, but it is up to DOI to decide what analysis is required before it transfers land under the Federal Land Policy and Management Act.

Mr Riggs. What sources of funding would be used by Lawrence Livermore to conduct the requested study?

Admiral Guimond. It is our understanding that DOI is examining that issue now.

WARD VALLEY

Mr. Riggs. How do the State of California's environmental monitoring system requirements for Ward Valley compare to systems currently in place at DOE low-level radioactive waste disposal sites in Nevada, Idaho, and Washington?

Admiral Guimond. Environmental monitoring system requirements at Nevada, Idaho, and Ward Valley are quite comparable because of the marked similarities in their physical settings. Some key factors, such as annual precipitation, depth to ground water, and proximity to major surface streams, are not the same in Washington, and, therefore, its environmental monitoring requirements are different.

WARD VALLEY

Mr. Riggs. At which operating DOE low-level radioactive waste disposal sites are tritium migration test results available or underway?

Admiral Guimond. All DOE low-level radioactive waste sites have performed tritium migration tests.

Mr. Riggs. What is the purpose of these DOE studies, and how have the results been used?

Admiral Guimond. Generally the results have been used to determine regulatory compliance of the DOE facilities.

Mr. Riggs. If DOE sites are allowed to operate while such tests are ongoing, is there a reason the State of California should be prevented from doing likewise?

Admiral Guimond. It is not the Department of Energy's position that California should be prevented from performing tritium migration studies during operation of a low level radioactive waste facility. At the same time, it is up to DOI to determine what analysis to undertake before transferring land that is under its management.

WARD VALLEY

Mr. Riggs. If the Ward Valley project is terminated as a result of the Interior Department's actions, what practical effect would this have on Low-Level Radioactive Waste Policy Act implementation?

Admiral Guimond. We hope the Ward Valley project will go forward, and we cannot speculate about the effect if it were terminated.

WARD VALLEY

Mr. Riggs. Is DOE willing to accept for disposal low-level radioactive waste from waste generators in States unable to provide for low-level radioactive waste disposal due to actions by the Federal government?

Admiral Guimond. No preparations have been made for DOE to accept low-level radioactive waste from waste generators in States that are unable to provide for state-sponsored disposal. Given the constraints on the Department's budget and facilities and the absence of appropriated funds for that purpose, it would not be possible for DOE to undertake such a task at this point in time.

FUSION ENERGY

Mr. Frelinghuysen. Please explain the role of the Princeton Plasma Physics Laboratory and its infrastructure in DOE's planned fusion energy science program for FY97?

Dr. Krebs. In its recommendations for a restructured Fusion Energy Sciences Program, the Fusion Energy Advisory Committee emphasized the importance of the Princeton Plasma Physics Laboratory as a critical national resource for fusion science. Having adopted these recommendations, the Department envisions that Princeton will take the lead in some of the increased effort to be directed at investigating alternative fusion concepts and additional international collaborations in fusion science. In order to maintain an experimental program there after shutting down the Tokamak Fusion Test Reactor, we would establish at least one modest cost, scientifically aggressive new experiment that would use our investment in the laboratory's existing infrastructure. The fiscal year 1997 budget request includes $5.0 million for design and fabrication of the National Spherical Tokamak Experiment that is intended to address that objective.

Mr. Frelinghuysen. The FEAC report states, "TFTR (the Tokamak Fusion Test Reactor) is a $1 billion facility now in a period of extraordinary productivity exploring newly-discovered confinement regimes in a D-T (deuterium-tritium) environment." Can you comment specifically on the contributions to the U.S. fusion energy science program already made by the TFTR and DOE's plans for the TFTR?

Dr. Krebs. The contributions of the Tokamak Fusion Test Reactor (TFTR) experiment to the fusion energy science program are numerous and include: world record temperatures in excess of 500 million degrees Celsius, first observation of the theoretically predicted "bootstrap current" critical to the efficiency of tokamak fusion power plants, attainment of over 10 megawatts of fusion power using actual deuterium-tritium fuel, and observation of a new enhanced confinement regime leading to previously unattainable low values for loss of the plasma energy from the center of the tokamak.

DOE plans to maintain the capability to operate TFTR into fiscal year 1998 to carry out the scientific objectives uniquely obtainable in TFTR. A mid-year evaluation by the Fusion Energy Advisory Committee in fiscal year 1997 will assess the progress in TFTR prior to committing to operation in fiscal year 1998. At the latest the experiment would be shut down by the middle of 1998 to permit increased efforts on tokamak improvements and alternative concepts.

Mr. Frelinghuysen. The Princeton Plasma Physics Laboratory had a 260 person staff reduction in 1995 and since 1992, the laboratory staff has been cut in half. These reductions have had an impact on the laboratory's ability to recruit and maintain the best and brightest researchers. The PPPL has trained over 160 doctoral students who have gone on to make professional contributions to do work in fusion as well as many other fields dealing with plasma science. Unless the field of fusion energy sciences is viewed as a viable research endeavor, I am afraid that new young scientists will avoid this field. Can you articulate the DOE's commitment to the fusion energy science program?

Dr. Krebs. The Department is committed to maintaining a fusion energy research program that is focused on the scientific foundations that underlay the ultimate realization of a fusion energy power source. We envision that the Princeton Plasma Physics Laboratory will take a leadership role in sustaining a stimulating scientific environment for fusion research.

ENVIRONMENTAL MANAGEMENT

Mr. Frelinghuysen. The Administration projects savings of $630 million from privatizing low-level mixed waste treatment and laundry services at Hanford. What is the basis for this estimate?

Admiral Guimond. The estimated savings for the low-level waste treatment is $570 million and the laundry is $40 million over 10 years. The basis for each is as follows:

Low-Level Waste Treatment

An engineering study and cost estimate for a standalone facility to process the mixed low-level waste was the original basis for the estimate. The facility cost was estimated at $410 million and $200 million in operating costs over twenty years for a total of $610 million excluding the contingency for facility construction of $210 million. These estimates were based on a cost plus contract method.

Subsequently, a privatized contractor was awarded, via a competitive bid process, a fixed-price contract for 24 million to process and treat about 90 percent of the low-level mixed waste. Working back from the $610 million (facility cost at $410 million and operating costs at $210 million), we get somthing close to a $590 million savings, but this only addresses 90 percent of the waste. The other 10 percent of the mixed waste requires remote handling and may be either processed at another Hanford facility or possibly characterized, packed and shipped to WIPP. Cost estimates are not available for this waste. Thus, the savings estimate of approximately $570 million involves considerable uncertainty and includes attempts to take into account the cost estimates available, the different types of contracting (fixed-price vs. cost plus), and other factors.

Laundry

The Hanford laundry was privatized in August 1993. Projected savings were estimated at $60 million over a ten year period (5 year contract with five one-year option periods) i.e., the total M&O estimate was $100 million vs. $40 million by the private sector.

The basis for these cost savings were the following:

1. A cost avoidance by not having to build a new laundry on site which was in design-$24 million.

2. A cost differential of $2.33 dollars per pound of laundry based on existing site cost of $4.03 vs. private costs of $1.70 per pound. With a projected volume of approximately 1.5 million pounds per year, estimated savings over a ten year period equals $35 million.

NUCLEAR WASTE

Mr. Frelinghuysen. Last year, the Department criticized Congress for providing only $400 million for the civilian nuclear waste program, suggesting that repository operations would be delayed. For that reason, it was surprising to see that DOE requested only $400 million for this important program. How did you arrive at this determination?

Dr. Dreyfus. The President's budget request for FY 1997 is consistent with the redirection resulting from the FY 1996 budget reduction. Of the $400 million request, $339 million will go to the Yucca Mountain Site Characterization Project; $10 million will go to the Waste Acceptance, Storage, and Transportation Project; and $51 million will be required for Program Management activities.

The $339 million we are requesting for the Yucca Mountain Site Characterization Project will be used to address the remaining scientific and technical uncertainties concerning the construction and operation of a repository at Yucca Mountain, and to regain a viable target to file a license application for a repository in the year 2002. This revised strategy for developing a permanent nuclear waste repository reflects the optimum program for determining the viability of a repository at Yucca Mountain in 1998, completing the necessary formal documentation and process (such as a Presidential site recommendation, environmental impact statement, and license application to the Nuclear Regulatory Commission), and licensing a repository.

The $10 million we are requesting for the Waste Acceptance, Storage, and Transportation Project will be used to continue the administrative and coordination activities that the Program is responsible for under the Nuclear Waste Policy Act and to support progress on non-site-specific initiatives that will address the long lead time activities that must precede removal of spent nuclear fuel from reactor sites once a Federal facility becomes available.

The $51 million we are requesting for Program Management activities will be used to maintain activities related to quality assurance; human resources and administration; technical and regulatory integration and planning; and program direction, including Federal salaries.

Mr. Frelinghuysen. What is the estimated date for repository operations at this funding level?

Dr. Dreyfus. Assuming adequate resources are made available each year and that the regulatory framework of the program is appropriately updated, the Department believes it can retain its long-term goal of beginning waste emplacement operations in 2010.

Mr. Frelinghuysen. The General Accounting Office has concluded that the State of Nevada improperly used funds provided them by the Department to influence legislative activities. Will the Department consider this finding in its consideration of future grants to the State?

Dr. Dreyfus. As the Director of the Office of Civilian Radioactive Waste Management testified before your committee on March 26, 1996, the Nuclear Waste Policy Act provides that the Department shall make grants to the State of Nevada and the affected units of local government. The Act did not make these grants discretionary in nature.

The fiscal year 1995 Energy and Water Development Appropriation Act provided for treating a recipient differently if it failed to certify that it used the funds in compliance with the Nuclear Waste Policy Act. By not providing such a certificate, that entity would be prohibited from any further funding provided for similar activities. The State of Nevada did certify to the use of fiscal year 1995 funds. Therefore, this provision does not allow us to exclude the State from future funding requests. We will, however, carefully evaluate funding requests to determine appropriate activities and funding levels to be covered under grants.

NUCLEAR WASTE

Mr. Frelinghuysen. The budget documents indicate that the Yucca Mountain project will receive the bulk of nuclear waste program spending in FY97. Please provide funding estimates for Yucca Mountain site characterization beyond FY97, and indicate whether site characterization will continue to receive the bulk of program funding?

Dr. Dreyfus. For Fiscal Year 1998, the Program proposes a funding level of $330 million for the Yucca Mountain Site Characterization Project, which is 90 percent of the total projected funding level of $368 million. The $330 million will be used to complete excavation of the east-west drift of the exploratory studies facility, continue subsurface and surface-based testing analyses, complete the Yucca Mountain viability assessment, and continue repository environmental impact statement activities.

For Fiscal Year 1999, the Program proposes a funding level of $250 million for the Yucca Mountain Site Characterization Project, which is 75 percent of the total projected funding level of $334 million. The $250 million will be used to continue subsurface and surface-based testing analyses, complete the preliminary repository and waste package designs for the repository license application, and complete and issue a draft repository environmental impact statement.

ENERGY SECURITY

Mr. Frelinghuysen. I am concerned about the apparent lack of a commitment to promoting energy security. The U.S. currently imports 50 percent of its oil, and this level is projected to rise to 60 percent in the near-term. Many of the actions detailed in the DOE budget documents forecast long-term projects could yield benefits in 15 years -- such as improving auto efficiency. What is DOE doing to improve energy security in the near-term?

Mr. Reicher. According to the Energy Information Administration (EIA), the United States' net imports of oil for all of 1995 have averaged about 45 percent. Projections for 2005 are for net imports to increase to 57 percent (mid-range projection) and then remain fairly constant until 2015. So for both the near-term and the long-term, oil imports as a proportion of supply will increase.

The nation's primary and most important defense against actual or threatened disruptions in the supply of oil is the Strategic Petroleum Reserve. The Reserve, which the Department of Energy maintains, currently contains 584 million barrels of crude oil. The SPR serves as both a near-term, and to the extent the Reserve continues to be maintained, a long-term deterent to the use of oil as a political weapon. As global oil markets have transformed over the past two decades, the need for a large Strategic Petroleum Reserve has increased. Originally, the Reserve was viewed as a source of supply to provide oil to replace physical supplies that had been cut off. Today, the price of oil is set by the global market. Instead of merely providing replacement oil, in order to be effective, the Strategic Petroleum Reserve must be capable of influencing the world price of oil. In order to do so, a substantial Strategic Petroleum Reserve is necessary.

As indicated in your question, the Department of Energy has a variety of R&D activities that are aimed at lessening our long-term dependence on potentially unstable sources of imported oil. The most important of these activities are demand reduction efforts, aimed at lessening our use of oil. Today, and for the foreseeable future, our greatest use of oil is in transportation. Fully two thirds of our oil consumption goes towards transportation uses. Therefore our transportation programs are all targeted towards improving the efficiency of fuel use of vehicles, or finding suitable non-oil alternatives for vehicle use. These efforts will have long-term impact, most likely beyond the 2015 time frame now embodied in the EIA's latest Annual Energy Outlook 1996.

In the near-term, however, much our the Department's R&D efforts are directed towards increasing the supply of oil and gas and are embodied in the budget of the Office of Fossil Energy. While that Office's total budget request for FY 97 fossil R&D is $348 million, the request for R&D projects for natural gas and petroleum technology total $156.25 milion, or about 45 percent of the Fossil Office's R&D request. It is here that near-term energy security issues are addressed through an effort to increase overall domestic oil and gas production and especially from marginal oil and gas wells.

The Department's request for Advanced Exploration and Production Technology ($15 million in the natural gas program; $40 million in the petroleum program) will continue the Department's highly leveraged program with U.S. industry to bring down the costs of innovative

exploration, drilling, and production technologies. Through a combination of innovative technologies and lower regulatory compliance costs, the Department's goals are to reduce the decline in domestic production by nearly 1 million barrels per day; increase natural gas production by nearly 2 trillion cubic feet per year; and enhance the value of Federal lands which account for 20% of the Nation's oil production and 35% of the Nation's natural gas production.

Applying sound science, risk-based analysis, and credible methodologies can dramatically reduce environmental and safety compliance costs for the industry without impairing public health and safety or endangering the environment. New, lower cost environmental compliance technologies can also reduce economic burdens and allow more dollars to be invested in actual oil and gas production.

The Department also has a downstream oil and gas program that offers opportunities for increasing the supply of domestically-produced energy reaching U.S. consumers. The budget is $11.80 million for programs such as gas storage, natural gas utilization, oil processing, and downstream operations research.

All of these program are expected to produce results in the near-term.

While the foregoing highlights several programs, one of the themes underpinning the Department's overall budget is to enhance our energy security. The Department's overall R&D budget has elements of enhancing our nation's energy security in the short-term and the long-term. Providing the opportunity for research and development in energy efficiency, renewables, fossil, and basic energy research, all help the Nation maintain its energy and national security.

NATIONAL LABORATORIES

Mr. Frelinghuysen. The Galvin Task Force recommended transferring functions from Lawrence Livermore National Laboratory to Los Alamos National Laboratory, but this Administration rejected this recommendation. Please explain why this recommendation was rejected?

Dr. Reis. We reviewed the Galvin Task Force recommendation to transfer the nuclear weapons functions from Lawrence Livermore National Laboratory to Los Alamos National Laboratory very carefully especially in light of the President's decision to seek a "zero" yield Comprehensive Test Ban Treaty (CTBT). That decision, announced August 11, 1995, was based in part on assurances I and the Directors of the Nuclear Weapons Laboratories provided the President that we can meet the challenge of maintaining our nuclear deterrent under a CTBT through a Science-Based Stockpile Stewardship program without nuclear testing. To meet the challenge of ensuring confidence in the safety and reliability of our stockpile, the President concluded that the continued vitality of all three DOE nuclear weapons laboratories will be essential.

Mr. Frelinghuysen. Does the Department believe that defense labs should be re-sized to reflect the end of the Cold War?

Dr. Reis. The end of the Cold War has been one of the key considerations in this department's continuing efforts to reinvent itself. In the case of the defense laboratories, the need to re-think the Nation's nuclear weapons program has been widely recognized. As a result, several high-level groups have visited the issue of "re-sizing" the Defense Programs laboratories. Most relevant are the Commission on Alternate Futures of the Department of Energy National Laboratories (Galvin), the National Security Panel of the University of California's President's Council on the National Laboratories (Drell Panel), and the JASON Program Office of the MITRE Corporation. Correspondingly, the Nuclear Posture Review, Presidential Decision Directives, and Public Law 103-160 all address the need to maintain the core competencies of the United States in nuclear weapons without nuclear testing.

We established the Stockpile Stewardship and Management Program to address these very challenges. This program right-sizes the production complex to accommodate a smaller stockpile redefines or re-sizes (as you phrase it) the roles and responsibilities of the Defense Programs laboratories in Stockpile Stewardship to specifically meet the challenge of maintaining our nuclear deterrent under a Comprehensive Test Ban Treaty regime.

NATIONAL LABS

Mr. Frelinghuysen. The Galvin Task Force warned against expanding the missions of the national labs in order to justify current funding levels. However, it seems the Department is expanding the missions of the labs to include missions such as "promoting environmental quality" and "enhancing U.S. industrial competitiveness." Does the Department believe the labs should be given new missions, or should they be focused on current missions?

Mr. Reicher. The missions of the Department's National Laboratories are not new, but enduring. Their missions address important public interests in energy and national security. Both of these, in turn, have significant environmental dimensions, particularly as related to energy production and use and the remediation of contaminated sites stemming from atomic energy defense activities. Finally, the Department and its National Laboratory system constitutes an extraordinarily valuable and unique scientific and technical asset which, often at great benefit to DOE mission accomplishment, can be shared with U.S. industry and universities to make America cleaner, stronger, more competitive and secure. These are not new or expanded missions. These are sensible ways of conducting business and fully exploiting the benefits of public R&D investments within existing and continuing missions.

TRANSMISSION TARIFFS

Mr. Frelinghuysen. Last year, the Department indicated that the power marketing administrations would file transmission tariffs similar to those required of investor-owned utilities by FERC. Will these tariffs be submitted to FERC for their review, or will it be up to the PMAs to decide whether they have made adequate commitments to provide open access?

Mr. Simpson. Alaska Power Administration does not intend to file open access tariffs. Due to the unique configuration of the electrical system in Alaska, none of the transmission lines in Alaska are involved in interstate or international commerce. APA is also in the process of transferring the projects to non-Federal ownership, which would remove APA from the rate process for these projects.

Bonneville is currently in a regional public process for review of its proposed tariffs. This process was instituted by Bonneville at the request of its transmission customers to provide an opportunity to test Bonneville's transmission tariff proposals against, and to develop a regional approach to, the open access and comparability standards of the FERC. Once the public process is complete, Bonneville intends to submit its proposed tariffs to FERC for their review.

The Western Area and Southwestern Power Administrations are being responsive to the Department's commitment to FERC to have the PMAs with transmission facilities publish generally applicable open-access, wholesale-transmission tariffs. Southeastern Power Administration owns no transmission lines.

Southwestern Power Administration has an open access policy. Tariffs developed for transmission services apply equally to all users and potential users of the system. Southwestern is a member of the Southwest Power Pool. The rates and associated terms and conditions for Southwestern transmission services will continue to be published, consistent with the final FERC rule. Rate schedules for Southwestern transmission services are filed with FERC.

Western Area Power Administration has an open access policy and is currently a member of two voluntary regional transmission groups (RTGs). The FERC certification for these RTGs requires members to offer comparable transmission services to other members. Western has provided the RTGs of which it is a member with its transmission rates and terms and conditions associated with transmission services. When Western's rate for these transmission services are changed (for example, as a result of "unbundling" services), these rate changes will be filed with FERC. However, the terms and conditions associated with these services, which are the other part of a transmission tariff, will not be filed with FERC, but will be provided to the RTG membership.

STRATEGIC ALIGNMENT

Mr. Frelinghuysen. One of the largest elements in Strategic Alignment was the sale of the PMAs, which would have raised $3.7 billion. However, the Department did not propose selling the power marketing administrations. Can you explain why the agency claims that it will deliver $14.1 billion in savings if it no longer proposes the sale of the PMAs? Should your target be lowered to approximately $10 billion?

Mr. Vivona. Our original $14.1 billion savings amount did assume the sale of the PMAs. We have subsequently withdrawn proposals for the sale of the PMAs, except for the Alaska PMA, resulting in a reduction in Departmental savings of $3.6 billion over the next five years. However, other savings initiatives are proving more productive than had been anticipated or have emerged since the $14.1 billion savings target was proposed. These savings estimates are currently under review and will be made available no later than the end of April.

UNIVERSITY OF CALIFORNIA PENSION FUND

Mr. Frelinghuysen. I understand that the pension system for the University of California is currently overfunded by about $1 billion. What have you done to address this problem? (It was about $600 million when she took office.)

General Durham. The task of managing a large defined benefit pension plan is extremely complex and difficult even under ideal circumstances The funding of such a plan is an attempt to anticipate liabilities which will not become actual costs for a generation or more (20+ years). Forecasting each participant's eventual cost to the plan requires estimates of the participant's future salary stream, the chance of survival to each age, the chance of continuance in employment, the chance of dependents' survival, the pattern of cost-of-living adjustments after retirement, as well as the rate at which money should be discounted from each future age to the current age. Such estimates require the specialized skills of an actuary, most of whom freely admit that their funding forecasts are subject to annual revision.

In the case of the University of California contract, the funding has produced ambiguous results. Investment returns on the University of California Retirement Plan asset portfolio have been excellent in recent years. The Department greatly benefits from the economy of scale afforded by the Department's participation in a plan whose assets exceed $20 billion. However, this has produced the appearance of overfunding. Abrupt changes in pension assets tend to overshadow the more sluggish changes in pension liabilities.

In the Department's administration of the University of California contract, the Department has encountered restrictions on its ability to retard pension liability which have not surfaced in other contracts. The University of California Retirement Plan is a state pension plan. Therefore, decisions regarding the University of California Retirement Plan (and its funds) involve parties not normally involved in the Department's contracting, such as elected officials (Federal and State), a board of regents, and public auditors. The difficulty of accommodating the concerns of these sundry parties has hampered the Department's ability to limit its funding liability to the University of California Retirement Plan.

The Department has sought to expand its role in the University of California Retirement Plan oversight at every turn. As part of this effort to tighten accountability in all of its contracts, the Department recently implemented more stringent pension reporting requirements in its contract with the University of California. Each time Federal legislation has passed which affects pensions, the Department has carefully reviewed new provisions for possible limitations which the Department could impose on the University of California plan. In recent months, the Department has successfully argued that Section 401 of the Internal Revenue Code is generally applicable to the University of California Retirement Plan because of the tax consequences for the University of California Retirement Plan's participants. The Department has twice solicited formal advice from

established pension consultants on ways in which the Department can control its liability to the University of California Retirement Plan. These consultants have concluded that absent special legislation the Department's options to further influence the University of California Retirement Plan administration are extremely limited.

DEPARTMENTAL TRAVEL

Mr. Frelinghuysen. The House Appropriations Committee projects DOE will spend $82 million on travel for DOE employees in FY 1997, and $275 million on travel for contractor employees. How much does DOE project it will spend on travel in FY 1997.

Mr. Vivona. If the Department's budget request were funded, the Department estimates that it would spend $74M in Federal travel and $220M in contractor travel (not including any contractor travel associated with the Power Marketing Administrations or the Federal energy Regulatory Commission).

Mr. Frelinghuysen. The budget documents indicate that the travel budget for the office of the Secretary is $300,000. However, the DOE Inspector General testified that the Secretary spent $3.7 million on travel during 1993-1995. Given that fact, please explain how the agency funds the Secretary's travel? Does it use money from other program accounts.

Mr. Vivona. The Inspector General was asked to testify about the costs of Departmental Trade Missions. The figures quoted, therefore, refer to the total costs of the Department's trade missions (some of which were headed by the Secretary), and not to the travel of the Office of the Secretary. All travel conducted by those working in the Office of the Secretary are funded from the Office of the Secretary travel account. Further, the travel costs of any security traveling with the Secretary are, starting in 1996, funded from this account. Program offices do not fund the travel of the Office of the Secretary.

YUCCA MOUNTAIN

Mr. Bevill. Progress reports from Yucca Mountain have been very encouraging over the past year I am curious to know how you have achieved such good results and whether you anticipate to be able to continue your recent track record into the future.

Dr Dreyfus. The Department has made significant progress over the past year at Yucca Mountain with accomplishments that often exceeded our targets. This success can be attributed to several factors including: successful program and project leadership and management; focused planning efforts which will keep viability assessment in our sights; focused approaches to better define the scopes of work and schedules, and to manage to them; monthly productivity and efficiency reviews; right-sizing our resources to match scopes of work; and, earlier availability of scientific data due to significant Tunnel Boring Machine progress in the construction of the Exploratory Studies Facility. The Department plans to continue to seek greater efficiency and productivity during the characterization program at Yucca Mountain.

Mr. Bevill. The progress made at Yucca Mountain would suggest that our knowledge of the mountain and its suitability as the permanent storage site would be better today than it was last year. Do you agree?

Dr. Dreyfus. Yes. As site characterization studies continue, we are increasing our understanding of Yucca Mountain and our confidence in that site as a suitable location for a repository. There are a number of reasons why the Department's confidence in Yucca Mountain is rising. Improved age dating and residence time dating of pore waters and fracture fillings and pneumatic testing provide a significantly improved basis for evaluating the site. Process modeling and Total Systems Performance Assessment has allowed the Department to reduce the suite of radionuclides which require detailed study from the twenties to three. Project scientists are converging on a preferred hydrologic model for the site and confidence is building in the site ground water transport model as well.

Mr. Bevill. What are some of the more significant discoveries at Yucca over the past year?

Dr. Dreyfus. There have been some significant discoveries at Yucca Mountain in three major areas of site investigation: vulcanism, earthquakes, and movement of air and water through rock.

The Yucca Mountain Project conducted the Probabilistic Volcanic Hazards Analysis (PVHA) expert judgement project. The purpose of this project was to elicit an assessment from an expert panel of earth scientists of the probability of a volcanic event disrupting the potential repository at Yucca Mountain and to quantify the uncertainties associated with this assessment.

The PVHA project was centered around four workshops and two field trips that provided an opportunity for technical discussions and interactions, with the objective of ensuring a common understanding of the issues to be addressed. The members of the expert panel were supplied with all pertinent data gathered by the Project, the State of Nevada and the Center for Nuclear Waste Regulatory Analysis.

While a wide variety of approaches were used by expert panel members, the preliminary mean probability of a future volcanic event directly penetrating the repository and erupting at the surface is approximately $2x10^{-8}$ events per year or about a 1 in 50,000,000 chance. The expert panel's estimate of probability is virtually identical to that produced by Project scientists, suggesting that the volcanic hazard is now fairly well bounded by a wide range of scientific interpretations.

Fifteen new digital seismic stations were added to the Southern Great Basin Network These new stations are proving to be considerably more sensitive than the older analog recording stations and have lowered the seismic event detection threshold in the vicinity of the proposed repository to a magnitude - 1 to -1.5 event. During the past year, no events above the detection threshold have been observed beneath the proposed repository block.

Significant conclusions related to the movement of air and water include:

Zeolitic formation within the Calico Hills unit coincides with the distribution of perched water along the interface between the Calico Hills and Topopah Springs units.

Analysis of pneumatic signals from NRG-6 and NRG-7a indicates that Exploratory Studies Facility effects are insignificant at distances greater than 500 meters.

Mr. Bevill. The Administration has made clear their objections to siting an interim storage facility before a permanent repository is named. Does the Department have another plan for accepting commercial spent fuel by the 1998 statutory deadline?

Dr. Dreyfus. The Department has concluded it has no legal obligation to begin accepting spent fuel in 1998, in the absence of a repository or other facility constructed under the Nuclear Waste Policy Act. The Department has no alternative plans to accept commercial spent fuel until such a facility is operational.

Mr. Bevill. DOE's Office of Civilian Radioactive Waste Management has stated that by 1998 DOE will be ready to issue a "viability assessment" for siting the high-level nuclear waste repository at Yucca Mountain. Please discuss your understanding of this term, especially in relation to your statutory responsibility to certify "site suitability" for a permanent repository.

Dr. Dreyfus. The viability assessment will provide information in 1998 on the feasibility of continuing with the Yucca Mountain Project, while the formal site suitability determination is part

of the Department's process for the site's formal recommendation to the President. This recommendation would invoke the formal process set forth in the Nuclear Waste Policy Act culminating in a license application to the Nuclear Regulatory Commission in the year 2002. It is important to draw a distinction between the determination that the site is suitable, with the legal and technical implications of finality, and the earlier step which we have been referring to as a viability assessment. This viability assessment will reveal any significant obstacles to the feasibility of a repository proposal. It will determine that adequate technology exists to do what is proposed in the design, it will evaluate the projected capability of that design in the geologic setting to contain radionuclides, it will estimate the cost of constructing the repository in accordance with that design and determine the potential capacity of the repository. If a repository can be built with reasonable assurance of safety and within rational cost, we will know by 1998 and subsequent site suitability activity can continue.

NUCLEAR WEAPONS TRANSPORTATION CANISTERS

Mr. Bevill. A DOE Inspector General's report from October of 1995 detailed the development and production by DOE of nuclear weapons transportation canisters for the Air Force that the Air Force did not want and ultimately did not accept. The development and production costs were listed by the IG at around $30 million. What have you done to insure that this type of incident is not repeated?

Dr. Reis. The Department initiated Transportation Accident Resistance Containers (TARCs) development and prototype production to meet the projected needs of USAF for overseas and CONUS shipments by air. The potential for the use of TARCs by the USAF required 2 to 3 years lead time for the Department to develop and produce containers. When former President Bush announced the return to the U.S. of many nuclear weapons deployed overseas, DOE believed air transportation for USAF weapons safety would be enhanced by using TARCs on weapons containing conventional high explosives (CHE).

During the late 1970's and 1980's, the Army used TARCs, furnished by DOE, very effectively in shipment of CHE nuclear weapons. Based on this experience with the Army, DOE believed that the USAF would use the TARCs, if available, and chose to err on the side of enhancing the safety of these shipments. Therefore, the DOE was faced with supporting needs it believed the Air Force required and supporting these requirements, potentially, on a very short notice. However, both the Assistant to the Secretary of Defense (Nuclear, Chemical & Biological) (formerly Atomic Energy) and the Secretary of the Air Force issued a policy directive on the use of TARCs for air shipments of nuclear weapons containing conventional high explosives only after the weapons air shipments from overseas were completed. The Air Force, subsequently, has chosen to use DOE highly protective, safe secure trailers to move all conventional high explosive weapons by ground transportation within the U.S.

Mr. Bevill. Please detail how your office has implemented the three recommendations made by the IG in their report.

Dr. Reis. The first recommendation is to obtain a final decision from the DoD on their acceptance and agreement to use containers developed for the Air Force. Until a decision is reached, the Department should not take any action to build or modify containers for the Air Force.

The USAF has decided to transport all nuclear weapons containing conventional high explosive on the road using DOE safe, secure trailers in CONUS. The USAF has no weapons containing conventional high explosives overseas; therefore, USAF need for these TARCs does not exist. The Department has terminated the program to build or modify containers for the Air Force until a firm requirement has been established.

The second recommendation is to take appropriate action to dispose of the accident resistant containers and related equipment if it is found that there is or will not be any future use for them.

The DOE is currently evaluating other potential uses for these containers including the Department's emergency management mission. While these evaluations are being completed, the TARCS are being stored in an underutilized DOE facility with other Defense Programs hardware. The TARCs disposition decision will be made in FY 1997.

The third recommendation is to ensure the implementation of policies and procedures to prevent spending resources on the production of products before the Department and the customer (intended user) agree to the need and the customer agrees to use the product.

We continue to believe that sufficient communication lines, formal as well as informal, exist between DOE and DoD for weapon safety related issues. To satisfy the Department's joint safety responsibility with DoD, we believe that the Department should undertake proactive development and prototype production efforts to enhance weapon safety, and anticipate future requirements for safety enhancements and make them available to the services on a timely schedule for implementation. In this instance of TARCs intended for the USAF, a prudent decision was made to initiate limited TARC production to ensure the USAF could implement weapon safety improvements when needed to enhance public safety. However, we will, to the extent feasible, establish a prior customer requirement before new safety products are manufactured.

Mr. Bevill. The IG's report indicated that DOE felt confident that current regulations and oversight procedure are adequate to protect against this type of error from reoccurring. If this is true, what happened in this instance - was it totally management error and if so what steps have been taken to make sure that it doesn't happen again?

Dr. Reis. The Department of Energy (DOE) has sufficient coordination and interaction with the DoD staff to avoid recurrence. The DOE Headquarters (HQ) Office of Defense Programs and the Albuquerque Operations Office have various communications channels with the DoD HQ staff and individual military commanders designed to provide weapon safety and operational information directly. The DOE and DoD liaison consists of participation in the following joint organizations: Nuclear Weapons Council (NWC), Nuclear Weapons Council Standing and Safety Committee (NWCSSC), NWC & NWCSSC Action Officer group, and Project Officer Groups (POGs). In addition, DP has assigned DOE staff to the Office of the Assistant to the Secretary of Defense (Nuclear, Chemical & Biological). This individual works daily with DoD staff and the NWC staff addressing issues and serving as an information conduit to the DoD. This staff interaction enhances high level coordination and guidance concerning nuclear weapon safety. Therefore, we do not foresee any compelling need to create additional levels of government bureaucracy in this regard.

In the development of the TARCs, DOE discharged its joint responsibility with DoD for nuclear weapon safety matters, including weapon transportation, pursuant to the Atomic Energy Act, as amended. The Department has a responsibility to conduct research and development programs to develop state-of-the-art technology needed to enhance weapons safety and security. The Department must also anticipate potential needs for safety and security improvements and provide safety enhancement hardware to the military on a timely schedule. In the future, the DOE will assure a requirement and commitment exist before production.

Mr. Bevill. This incident intimates that DOE's safety standards for nuclear weapons transportation are much stricter than those practiced by the Air Force. Do you believe that the Air Force's safety standards for the transportation of nuclear weapons are adequate to protect public safety?

Dr. Reis. Presently, the USAF has opted to transport the weapons containing conventional explosive by ground transport. The DOE and the DoD continue to exercise their statutory requirements for the safe transport of nuclear weapons.

NONPROLIFERATION AND NATIONAL SECURITY BUDGET

Mr. Myers. DOE's fiscal year 1997 funding request for Nonproliferation and National Security's Arms Control Programs is 25 percent larger than the fiscal year 1996 funding level. Do you anticipate this trend to continue either in the short or long term?

Ms. Rohlfing. The Nonproliferation and National Security Arms Control programs are likely to grow slightly in the short term and remain level for the long term. The twenty-five percent increase from FY 1996 to FY 1997 reflects the rapid expansion of the Materials Protection, Control and Accounting (MPC&A) Program and an expanded Industrial Partnering Program.

INTERNATIONAL NUCLEAR SAFETY PROGRAMS

Mr. Bevill. The goals of the Department's activities in Russia and other Eastern European countries to increase the safety of nuclear energy operations and to curb proliferation of fissionable materials are very worthy goals. I am curious to know, however, if you feel that the benefactors of these programs are fully implementing and maintaining the lessons we have promoted.

Dr. Lash. One of the goals of our Soviet-designed reactor safety program is to support the development of an indigenous nuclear safety infrastructure in the host countries which is necessary to sustain adequate levels of safety. For this to occur, these countries will be required to implement the nuclear safety improvements we have encouraged and maintain them into the future. We have evidence that this is occurring already. Through observations and training with U.S. operating crews, plant managers in Ukraine decided to provide additional operators in the control rooms to monitor critical safety functions. Additionally, Russia and Ukraine have greatly expanded their training staffs and facilities based on exposure to U.S. training practices which are associated with improved plant safety. Symptom-based emergency operating instructions have been implemented at the Novovoronezh plant. These new plant emergency procedures were drafted, analyzed and verified by Russian organizations with guidance and assistance by the U.S. Fire safety equipment has been delivered and is being used at the Smolensk and Leningrad plants in Russia and the Zaporizhzhya plant in Ukraine. Confinement improvements and emergency DC power upgrades (batteries) have been implemented at the plants in Russia.

The Department of Energy approaches the Materials Protection Control and Accountability (MPC&A) Program as a cooperative effort between the U.S. and the countries of the former Soviet Union (FSU). These countries recognize nonproliferation as an essential element of their national security. One clear example of how Russia plans to foster an indigenous MPC&A capability is in the development of the Russian Methodological and Training Center (RMTC) in Obninsk. The RMTC will provide the full range of MPC&A training to operators, inspectors, technicians, and related personnel after DOE's program of cooperation ends. Similar training efforts being implemented across the FSU ensure the maintenance of upgraded MPC&A in the years to come.

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH

Mr. Bevill. Please describe the Department's fiscal year 1996 Experimental Program to Stimulate Competitive Research program.

Dr. Krebs. The Department of Energy/Experimental Program to Stimulate Competitive Research program was moved in fiscal year 1996 from the Office of Science and Education and Technical Information to the Office of Energy Research, Office of Basic Energy Sciences. A strong effort is being made to increase the interaction of the Department of Energy/Experimental Program to Stimulate Competitive Research program with the research areas within the Department. Currently, the program has a total of nine active cooperative agreements with Experimental Program to Stimulate Competitive Research states covering research activities ranging from solid state, high energy and nuclear physics, to chemistry, materials science, environmental and life sciences, engineering and geosciences. The following states have received the Department of Energy/Experimental Program to Stimulate Competitive Research cooperative agreements for research implementation: Kentucky, Louisiana, Maine, and Montana (which were first awarded in fiscal year 1993); Alabama, Nevada and Puerto Rico (awarded in fiscal year 1994); and South Carolina and Wyoming (awarded in fiscal year 1995). In fiscal year 1996, there is a total of $7.0 million available for the Department of Energy/Experimental Program to Stimulate Competitive Research program. Six states (Kentucky, Louisiana, Maine, Montana, Alabama, Nevada) and the Commonwealth of Puerto Rico are eligible for renewal awards and have submitted applications to the Department for a maximum award of $1.0 million for a period of one year. The other two Experimental Program to Stimulate Competitive Research states are on the 2nd year of their two-year research implementation awards. The fiscal year 1996 Department of Energy/Experimental Program to Stimulate Competitive Research award announcements are expected to be made approximately mid-July 1996.

Mr. Bevill. Has the shift of oversight of this program to the Office of Energy Research had any impact on the Department's plans for this program or its management?

Dr. Krebs. Every attempt has been made to keep the impact of the shift of oversight of the Department of Energy/Experimental Program to Stimulate Competitive Research program to the Office of Energy Research to a minimum. Staff previously involved with the program were transferred to the Office of Basic Energy Sciences, to continue program oversight. No substantive changes have been made to program policies. Energy Research sees a real opportunity to support some first-class research efforts in Experimental Program to Stimulate Competitive Research states through this program.

Mr. Bevill. How does the Energy Experimental Program to Stimulate Competitive Research program complement the National Science Foundation's program?

Dr. Krebs. The Department of Energy/Experimental Program to Stimulate Competitive Research program truly does complement the National Science Foundation Experimental Program to Stimulate Competitive Research program by providing support to entirely different research efforts as identified in the research clusters. The National Science Foundation/Experimental

Program to Stimulate Competitive Research program encourages general science and engineering while the Department of Energy/Experimental Program to Stimulate Competitive Research supports energy-related research commensurate with the Department of Energy program interests. In addition, although the dollar amount of the Department of Energy program is much smaller than that of the National Science Foundation program, the Department of Energy does bring a tremendous research capability to the table in the form of the Department of Energy National Laboratories. The Department of Energy Experimental Program to Stimulate Competitive Research program is making an effort to use its support to encourage stronger interactions between Experimental Program to Stimulate Competitive Research-supported scientists and the Department of Energy National Laboratories. In doing this, scientists with Experimental Program to Stimulate Competitive Research support will be able to utilize the world-class research facilities at the national laboratories, and to establish collaborations with scientists at these laboratories. The Experimental Program to Stimulate Competitive Research state organizations have encouraged the development of this concept, and it enables the Experimental Program to Stimulate Competitive Research program to leverage the very large investment at the national laboratories.

Mr. Bevill. How does it interface with Experimental Program to Stimulate Competitive Research programs managed by other federal research agencies?

Dr. Krebs. The Experimental Program to Stimulate Competitive Research program managers from each Federal program participate in the Experimental Program to Stimulate Competitive Research Executive Interagency Coordinating Committee which meets periodically to compare notes, to learn about the substance of programs in other agencies, and to learn about new ideas in administering these programs. The Department of Energy/Experimental Program to Stimulate Competitive Research representatives also participate in Experimental Program to Stimulate Competitive Research conferences and annual meetings.

Mr. Bevill. What is your fiscal year 1997 budget request for Energy Experimental Program to Stimulate Competitive Research program?

Dr. Krebs. The fiscal year 1997 budget request for the Energy Experimental Program to Stimulate Competitive Research program is $7 million.

Mr. Bevill. Please provide details of plans for this program.

Dr. Krebs. The fiscal year 1997 Experimental Program to Stimulate Competitive Research program will include merit review of nine renewal applications for research support, and awards ranging up to $1 million in a single state to support research for various clusters. Efforts to encourage Experimental Program to Stimulate Competitive Research-supported scientists to take advantage of Department of Energy laboratory capabilities to enhance their research will be continued.

Mr. Bevill. Please provide if possible a five-year schedule of out-year funding for this program.

Dr. Krebs. We would expect this program to continue at approximately its current level of effort, depending on the overall budget situation.

Mr. Bevill. Would this budget request fund only renewals of existing Department of Energy Experimental Program to Stimulate Competitive Research implementation awards or would it permit additional proposals to be selected?

Dr. Krebs. We expect that the Department of Energy Experimental Program to Stimulate Competitive Research program will be able to support only renewals of existing awards based on the anticipated budget of $7 million. The Department has made commitments to support these efforts for up to six years, although they will be reviewed to ensure satisfactory progress. Such a long-term commitment in support is necessary for the conduct of research which can take several years before results can be anticipated. In our efforts to increase interactions between scientists from Experimental Program to Stimulate Competitive Research states and the Department of Energy laboratories, we will certainly include scientists from all Experimental Program to Stimulate Competitive Research-eligible states. If a research cluster becomes successful (in attracting other federal research support), then this would free up funds that could be competed for by other states.

Mr. Bevill. How does the Department derive the funding included in the budget for Experimental Program to Stimulate Competitive Research?

Dr. Krebs. In fiscal year 1996, funds for the Department of Energy Experimental Program to Stimulate Competitive Research program were taken from monies appropriated for the Office of Basic Energy Sciences program, although the research, through the Department of Energy/Experimental Program to Stimulate Competitive Research program spans the research interests of the Department.

Mr. Bevill. Is support derived only from the Basic Energy Sciences budget or do other Department of Energy agencies, such as the Office of Energy Research or other non-Office of Energy Research programs, contribute to its support?

Dr. Krebs. The research supported through the Department of Energy/Experimental Program to Stimulate Competitive Research program is requested as part of the Office of Energy Research Basic Energy Sciences' program budget only. Other non-Office of Energy Research programs do not contribute support for this program.

Mr. Bevill. Is this an appropriate way to support the Department's Experimental Program to Stimulate Competitive Research program or should Congress consider recommending funding as a specific budget item? Why?

Dr. Krebs. It is easiest to administer the program as a single component in the Office of

Basic Energy Sciences' budget, as opposed to gathering support from several different offices outside Basic Energy Sciences. We are trying to administer the program with the same care in which we allocate research support for our university grants and we have it in the right organization to do this. Certainly, expert advice is sought from other offices as needed.

NATIONAL INSTITUTE FOR GLOBAL CLIMATE CHANGE

Mr. Bevill. What is the Department's budget request for the National Institute for Global Environmental Change?

Dr. Krebs The Department is requesting $9 0 million for National Institute for Global Climate Change in fiscal year 1997

Mr. Bevill. The budget justification material indicates that funding for National Institute for Global Climate Change has been included within the four research areas supported by the Biological and Environmental Research Program. Please explain how this funding is allocated?

Dr. Krebs. National Institute for Global Climate Change supports research in all of the four areas of global change research. This includes Climate and Hydrology, Atmospheric Chemistry and Carbon Cycle, Ecological Processes, and Human Dimensions. Thus, while National Institute for Global Climate Change is funded as a distinct component of the Department's global change research program, the National Institute for Global Climate Change budget is shown as being distributed across all four of the research areas.

Mr. Bevill. What are the Department's plans for this program in fiscal year 1997?

Dr. Krebs. The Department will continue to work with National Institute for Global Climate Change to focus its efforts on the Department's global climate change research priorities Priority areas for National Institute for Global Climate Change include measuring the exchange of carbon dioxide and other energy-related trace gases between the atmosphere and major terrestrial ecosystems in the U.S., improving understanding of the consequences of atmospheric and climatic changes on major ecosystems and resources of regional importance, and improving understanding of the societal and economic implications of global climate change at regional scales.

Mr. Bevill. How does the National Institute for Global Climate Change support the Department's research activities?

Dr Krebs. The National Institute for Global Climate Change provides support for university-based research that is relevant to the Department's global change research program. The Department conducts a relevance review of those research applications recommended for funding by the National Institute for Global Climate Change regional centers. The Department also reviews the workplans recommended by National Institute for Global Climate Change for their relevance and value-added benefits to the Department's global change research needs

Mr Bevill Do the regional centers support research activities outside of the host universities?

Dr. Krebs. The goal of National Institute for Global Climate Change is that a minimum of 50 percent of the research funding be awarded to investigators outside the host universities of National Institute for Global Climate Change. Through fiscal year 1995, 63 percent of the research funding has been awarded to investigators outside the host universities of National Institute for Global Climate Change's six regional centers.

NATIONAL IGNITION FACILITY

Mr. Fazio. Madame Secretary, yesterday I raised the issue of the NIF with Assistant Secretary Reis and I would like to raise this with you as well. I fear that the National Ignition Facility's central role in the national arms control strategy is not widely understood in Congress in obtaining a Comprehensive Test Ban, even preserving the Non-Proliferation Treaty successfully negotiated last year. Key Members who traditionally take the lead on arms control have received conflicting messages about the NIF. They are reluctant to come forward. Other members who look to them for direction are confused. This confusion could have serious consequences in a Congress so anxious to cut funding.

So, I urge you and the Arms Control and Disarmament Agency to touch base directly with those who should be key supporters to make sure they understand what is at stake in this device. You should argue cost effectiveness as well as arms control, because NIF and the stockpile stewardship program are far less expensive than the likely alternative, which would be reversion to arms testing and production.

Dr. Reis. Thank you for raising this important issue. We have stated within the report "The NIF and the Issue of Nonproliferation" that the NIF "...contributes positively to U.S. arms control and nonproliferation policy goals by allowing the US to sign and abide by a zero-yield CTBT and by providing the U.S. continued confidence in its weapons to allow for further reductions...". John D. Holum, Director of the Arms Control and Disarmament Agency, in his letter of July 17,1995 to Senator Hatfield, stated: "The right to take the steps necessary to maintain our nuclear deterrent will be hollow -- and, indeed our arms control priorities could be placed in jeopardy -- if we do not have a stockpile stewardship program...". His letter went on to strongly support the NIF.

Failure to proceed with stockpile stewardship and particularly with the NIF could result in much larger costs for the alternatives. The loss of momentum in the nuclear arms control arena, that would be likely to result, could have consequences that far exceed the funding considerations.

We know that some observers will not agree with the Administration's approach of maintaining nuclear deterrent while seeking arms control and that the disagreement can produce confusion. We will seek ways to clarify our message and assure that members of Congress have the opportunity to fully understand the importance of NIF for Stockpile Stewardship and its contributions to U.S. arms control and nonproliferation policy goals.

PMA CUSTOMER INVESTMENTS

Mr. Fazio. Madame Secretary, as you know, customer groups have expressed interest in using contributed funds authorities to finance Operations, Maintenance and Rehabilitations (OM&R) on the PMA systems because even reimbursable federal appropriations are constrained and maintenance is lagging. If customers make these contributions and particularly if the rehabilitations constitute investments that require several years to amortize, is it not true that the residual value of these investments could easily be reimbursed at the time of PMA divestiture? The residual investment would simply become part of the purchase price, which would naturally be higher by the amount of the rehabilitation investments. True?

Mr. Simpson. Yes. Mr. Fazio, the funds advanced by PMA customers for replacements and rehabilitations would add to the value of the facilities and would become investments that would be reimbursed at the time a PMA was sold, provided that arrangements for such funding did not have limitations or specific conditions.

The Alaska Power Administration currently has authority to use contributed funds to upgrade, improve, maintain, and administer the Snettisham and Eklutna Projects. This authority was granted in the Alaska Power Administration Asset Sale and Termination Act. The act also authorizes the transfer of APA assets to new owners. APA will use its contributed funds authority to help facilitate the transfer of APA assets to new ownership. Since the use of the contributed funds is limited to those entities involved in the asset transfer, it should not impact or hinder the transfer of APA assets.

Mr. Fazio. Do you agree that if customers finance OM&R on components of federal PMA systems, the systems as a whole are enhanced and their desirability to potential buyers improved?

Mr. Simpson. Yes, customer financing of components of the Federal power system would assure that the power generation and transmission facilities would not deteriorate and would continue to provide a reliable resource to our customers. A well maintained and reliable system is more desirable to potential buyers.

PMA SALE

Mr. Fazio. In FY 1996 the Administration proposed selling the Power Marketing Administration's to existing customers at a price fully equal to the present value of the remaining debt. The Administration proposes no action for the PMA's in the 1997 budget submission. Should the Administrations propose sale in the future, can we have your assurances that it will be on the same terms as in 1996?

Mr. Simpson. I can not give absolute assurance that any future proposal by the Administration to sell the PMAs would include the same terms and conditions as the Administration's FY 1996 PMA sale proposal. However, I am confident that any future proposal would treat the interests of existing customers and other stakeholders fairly, as did the Administration's FY 1996 proposal.

HIGH ENERGY PHYSICS

INTRODUCTION: When the Superconducting Super collider (SSC) was terminated the High Energy Physics (HEP) program was essentially cut in half, requiring a radical restructuring At Congress' request, the Department commissioned a report prepared by a panel chaired by Dr Sidney Drell that recommended a strong national effort at about half the original level. It was based on upgrades of existing facilities (SLAC and Fermilab), some restored University funding where SSC losses were particularly acute, and some preliminary research funding to keep active the option of participating in the Large Hadron at CERN in lieu of the SSC.

Mr. Fazio. Madame Secretary, as you well know, the Drell panel recommendation for High Energy Physics included a temporary increase in the original HEP base program while physical upgrades of existing facilities at SLAC and Fermilab are completed. The Drell figure for FY 1997 is about $710 million in current dollars, compared with the Administration request of only $680 million (and with a total program, including SSC, of $1.3 billion in FY 1994. I know you have requested full funding for the upgrades in 1997 - and I support you in that - but what happens to the balance of the program?

Dr. Krebs. The discrepancy between the Drell projection for FY 1997 and the President's Request for FY 1997 has the result that, in the Drell Report terms, the "funding available for program restoration and new initiatives" is substantially less than that recommended by the Drell panel. The balance of the program is experiencing continuing fiscal pressures leading to reduced running schedules at the accelerator laboratories, continued reductions in employment and university support, and reduced funding for detector upgrades and new detector projects.

Mr. Fazio. Has the Department done an analysis of the consequences of this shortfall between the Drell recommendation and the 1997 request?

Dr. Krebs. The Department has not done a formal analysis of this issue, but the issue of balance and programmatic impact was addressed extensively in the planning and preparation of the FY 1997 Budget Request.

Mr. Fazio. What is it?

Dr. Krebs. The consequences of the shortfall are less than optimum running schedules at the accelerator laboratories, continued reduction in employment and university support, and new detector projects.

BIOFUELS

Mr. Fazio. Biomass ethanol is the only near-term, non-petroleum DOE transportation ogram capable of reducing the amount of oil imported by the U.S. Therefore, I am amazed that the DOE has not supported this promising technology more than it has in the past and has even cut the funding well below congressional direction in FY1996. Could you please explain why DOE is choosing biomass power over transportation fuels?

Ms. Ervin. The Department is not choosing biomass power over transportation fuels. The Department supports the research and development of biomass power and biofuels transportation technologies. Both biomass energy applications have significant potential in terms of oil reduction, job creation, rural development, and the environment. There are also synergies between the two programs. For example, the thermochemical gasification technologies that are being advanced under the biomass power program will be of value to the transportation fuels program, since the lignin portion of the biomass can be gasified but cannot be converted to ethanol. The lignin from an ethanol production facility will likely be used to produce electricity. Under FY1996 budget constraints, the Department made some difficult programmatic decisions, but managed to maintain balanced, focused programs for biomass power and transportation fuels.

Mr. Fazio. Although this committee appropriated $3 million in FY 1996 to the City of Gridley for its biomass ethanol pilot plant, necessary reductions to DOE budgets resulted in a 66% decrease to this allocation. While I applaud the level of funding for the Biochemical Conversion category in your FY 1997 budget, I am concerned that the Department is stretching itself too thin by setting aside $12.9 million for additional ethanol pilot projects. I believe we should first confirm that the Gridley project, for which there is no clear direction in the Budget Request, will be completed and that the necessary basic research at DOE laboratories is supported as well. I urge you to work with us to ensure that this promising research and pilot plant project receive the necessary amounts in FY 1997 to see this project through to completion. I also urge that the Department reconsiders its allocations under the Biofuels Energy Systems for FY 1996 and reallocates the monies to the biomass ethanol program as directed by this committee. I ask that you please comment.

Ms. Ervin. The Department appreciates your support for the ethanol program. As shown in our budget request, we have requested an increase of $12.9 million for industrial partnerships related to the ethanol program. This is in addition to our core research and development effort. With regard to the Gridley project, we have been instrumental in bringing together the principal project partners and have made our facilities available to the Gridley team. Our plans are to continue working to make this project a success. Presently, we are funding a feasibility study to assess the technology's potential in order to gain confidence from the private investment community. If the feasibility study shows positive results, the Gridley team should be in a favorable position to compete for demonstration funding.

FUSION

Mr. Fazio. I am pleased to see that you have recommended an increase in funding for fusion over this year's level. However, your recommended budget of $264 million falls somewhat short of the Fusion Energy Advisory Committee's recommended level of $275 million. Could you please explain the difference in the numbers--in other words, what doesn't get funded under the Department's budget recommendation?

Dr. Krebs. The Department has accepted the major recommendations of the Fusion Energy Advisory Committee, although the full $275 million program preferred by the Committee could not be managed within constrained budgets. The $264 million program supported by the Department's request allows, among other elements, for increased funding of DIII-D, TFTR and Alcator C-Mod experiments and for maintaining the U.S. commitment to the International Thermonuclear Experimental Reactor (ITER) Engineering Design Activities (EDA). However, the constrained budget does not allow us to strengthen our support of the ITER EDA by restoring some of our original tasks, nor would it allow us to fully exploit the capabilities of the DIII-D, TFTR and Alcator C-Mod, all of which were included in the Fusion Energy Advisory Committee's preferred $275 million case.

Mr. Fazio. In light of the fact that budget constraints will not allow the U.S. to pay for a full quarter of the costs of ITER, the Department has talked about some type of limited involvement in the construction phase of the project. Could you elaborate on this?

Dr. Krebs. The basic rationale for pursuing participation in any future International Thermonuclear Experimental Reactor (ITER) construction and operation activity is that ITER would provide the only means currently foreseen of experimenting with long duration, burning plasmas, a critical area for fusion science. Participation in such an international activity is fully consistent with the new Departmental fusion energy sciences policy, based on the recent advice from the Department's Fusion Energy Advisory Committee (FEAC). Another part of the FEAC advice on ITER, also Departmental policy, is to consider such participation within a financial constraint of today's level of ITER participation; any additional resources would require new funds for the U.S. program.

With this rationale and within this constraint, we are seeking possible approaches to participation that would allow us to contribute in a technically valuable, financially limited way. While no decisions or commitments have been made, we believe that the other Parties are seriously preparing to proceed to construction and would welcome U S. participation, even under the constraint of financial limitations. As FEAC suggested, the design and fabrication of diagnostics and control systems would be examples of U.S. participation where the U.S. expertise is highly developed and would represent a valuable project role and contribution. With this kind of contribution, we would seek an arrangement that provides the U.S. with full access to the science results and to much of the technology results and project management experience. At the same time, we must recognize that with a limited U.S. financial

contribution, there will be some information, especially hands-on manufacturing experience for major fusion components and systems, that the U S. will not obtain On balance, such involvement in ITER could be a highly leveraged, positive gain experience for the U.S. fusion energy science program.

Mr Fazio The recent report of the Fusion Energy Advisory Committee recommends that the governance of the fusion program and its elements be put on a more of a scientific peer-reviewed basis. How will the Department respond to this suggestion.

Dr. Krebs. The Office of Fusion Energy Sciences has actively used peer review of its programs including mail and on-site review of university applications. We have recently asked the Fusion Energy Advisory Committee (FEAC) through its scientific subcommittee to carry out difficult peer reviews of aspects of competing programs. We anticipate continuing to increase this greater level of involvement of working scientists in the governance of the program

FUSION ENERGY

Mr. Fazio. Madam Secretary, in the cover article of the most recent issue of the Atlantic Monthly, Deputy Secretary Charles Curtis writes about the importance of alternative energy research for meeting future energy needs. I was disturbed to see that there was no mention whatsoever of fusion research in that article. Is this lack of mention in Mr. Curtis' article in any way reflective of DOE's hope for fusion as a future energy source?

Secretary O'Leary. The lack of mention of fusion in the article is in no way reflective of DOE's perspective on the technical viability or importance of fusion as a future energy source. The technologies cited in the article are either available now or in the mid-term. Fusion power is a much longer term alternative and will not address nearer term national needs. While the Department believes that fusion will play a major and vital role in future bulk power generation, commercial fusion power plants are unlikely before 2040.

Mr. Fazio. The Photovoltaics program has supported industry cost-shared manufacturing and utilities initiatives. Is this resulting in any noticeable increase in US manufacturing capacity ?

Mrs. Ervin. Yes, US production volume went from about 17 MW in 1991 to about 35 MW in 1995. Much of this improvement is attributed to cost-shared programs, most notably PVMaT. This trend is expected to continue into 1996 and 1997.

RESOURCE ASSESSMENT

Mr. Fazio. I understand the Administration has requested zeroing out some cross-cutting research programs in renewables such as "Resource Assessment". Isn't this the kind of data collection and analysis that the federal government should be carrying out at its national laboratories that cannot be replaced by the private sector?

Mrs. Ervin. The Resource Assessment Program has served an important function in providing renewable energy resource information to U.S. industry to facilitate the deployment of renewable energy technologies such as, photovoltaics, wind, biomass, and geothermal. Existing resource data is believed to be sufficient to meet current industry needs for the next several years.

Unfortunately, our overall effort to reduce the renewable energy budget in FY 1997 has forced us to zero out this activity.

SOLAR THERMAL ENERGY SYSTEMS

Mr. Fazio. I understand that Solar Two, the solar power facility in California, will be dedicated in June and that a solar/dish engine manufacturing plant is being built in Texas. How do these cost-shared collaboratives with the utility sector and the Solar Enterprise Zone in Nevada drive these technologies to become more common in the marketplace?

Mrs. Ervin. Solar Two has been proceeding with system checkout and will be dedicated in June of this year. It will be operated as a 10 MWe molten-salt pilot plant of a commercial system. As such, it will provide the industry with data concerning the expected performance, improved dispatchability due to the 3-hour molten-salt storage capacity, and availability of a future commercial system. However, to build a commercial plant, the financial community will need to be convinced that a larger plant can be completed for the estimated costs based on design data and expected production cost reductions. The financial investors will typically require a greater rate of return for their investment on the first-of-a-kind commercial-size plant, and will also demand a power-purchase agreement to be in place. By constructing a power-tower plant at the Solar Enterprise Zone, it should be possible to have a more favorable power-purchase agreement in place and to receive investment capital at a lower interest rate.

The Department participated in cost-shared demonstrations of solar/dish engine systems with Cummins Power Generation Co. (CPG). They, on the basis of those demonstrations, are building their manufacturing plant in Texas with their own funds. Their ability to reduce their cost of production is intimately tied to the number of units that they can produce annually. By being able to provide dish/engine systems to the Solar Enterprize Zone, CPG should be able to significantly lower their production costs for any additional units.

Mr. Fazio. I am pleased to see the Administration's request support the Solar Building and Renewable Energy Production Incentive Programs. These small programs appears to be a great leaverager with the private sector and they focus primarily on small businesses and municipal utilities. For instance, SMUD in California has the world's largest solar, water, heating and photovoltaic installation program in the world and it's saving consumers money rather than building costly new generating capacity. Is DOE going to stand by these kind of programs as a long term investment?

Mrs. Ervin. We agree that the smaller solar programs can provide significant return for Federal investment. Our budget requests have reflected support for solar buildings program for over a decade and for the REPI program for the 3 years of its existence. We expect to continue to assign high priority to these areas.

WARD VALLEY

Mr. Fazio. Will DOE consider conducting Interior's requested tests without the concurrence of the State of California, which has licensed the Ward Valley site? If not, how would DOE's role be carried out consistent with its charges under the LLRW Policy Act to assist the States in developing such facilities, and California's authorities as an NRC Agreement State under the Atomic Energy Act?

Admiral Guimond. The Department of Interior has inquired about the availability of DOE's Lawrence Livermore National Laboratory (LLNL) to perform tests. We have advised DOI that we have authority under the Economy Act and the Atomic Energy Act to perform these tests on a reimbursable basis and that LLNL has the capability. We further advised DOI that we need a clearly defined scope of work. DOI has indicated that it is looking for the funding necessary to have the work performed. We would not require the concurrence of the State of California to proceed with the work DOI has discussed with us.

WARD VALLEY

Mr. Fazio. Does DOE believe its general authority to perform work for other Federal agencies under the Economy Act or the Atomic Energy Act would form a basis to justify conduct of the study irrespective of its duty to assist the states under the LLRW Policy Act? If so, on what basis would this be justified?

Admiral Guimond. We do not see a conflict between those authorities.

WARD VALLEY

Mr. Fazio. Does DOE believe the tritium studies requested by Interior would yield reliable, conclusive results regarding moisture and contaminant movement at the Ward Valley site?

Admiral Guimond. We do not want to prejudge the results before we have done analysis. Moreover, we have not discussed with DOI the precise nature of the analysis they would like LLNL to do.

Mr Fazio. Are such tests considered the best method to address such questions at desert disposal sites?

Admiral Guimond. The National Academy of Sciences has expressed the view that a more complete knowledge of groundwater and radionuclide movement would be obtained by "additional analysis from tracers such as 36CL" than from tritium tests. However, as noted above, we have not discussed with DOI the precise type of testing it wants LLNL to perform.

WARD VALLEY

Mr. Fazio. What experts were consulted in arriving at these judgments?

Admiral Guimond. DOE has not made a judgment about the best method of testing moisture and contaminant movement at Ward Valley. DOE is aware that Mr. Jay Davis, Associate Director of Environmental Programs at LLNL stated that tritium is not a good measure of moisture infiltration in arid regions and that experts from the NAS, the State of California and its contractors have concluded that tritium testing by itself does not provide conclusive results in these matters.

WARD VALLEY

Mr. Fazio. Does DOE believe that the National Academy of Sciences erred in concluding that additional tritium tests could be conducted during construction and operations, rather than requiring them prior to a land transfer decision as Interior believes?

Admiral Guimond. We have no technical basis to disagree with the NAS finding, but it is up to DOI to decide what analysis is required before it transfers land under the Federal Land Policy and Management Act.

Mr. Fazio. What sources of funding would be used by Lawrence Livermore to conduct the requested study?

Admiral Guimond. It is our understanding that DOI is examining that issue now.

WARD VALLEY

Mr. Fazio. How do the State of California's environmental monitoring system requirements for Ward Valley compare to systems currently in place at DOE low-level radioactive waste disposal sites in Nevada, Idaho, and Washington?

Admiral Guimond. Environmental monitoring system requirements at Nevada, Idaho, and Ward Valley are quite comparable because of the marked similarities in their physical settings. Some key factors, such as annual precipitation, depth to ground water, and proximity to major surface streams, are not the same in Washington, and, therefore, its environmental monitoring requirements are different.

Mr. Fazio. Would you characterize California's system as more or less comprehensive than DOE's monitoring systems?

Admiral Guimond. We believe the environmental monitoring system at Ward Valley is closer to state-of-the-art than most DOE systems. DOE support of the environmental monitoring committee requested by California as technical assistance from DOE after the land transfer will help ensure the comprehensiveness of the Ward Valley system and could give insights on how to improve DOE's systems.

WARD VALLEY

Mr. Fazio. At which operating DOE LLRW disposal sites are tritium migration test results available and/or underway?

Admiral Guimond. All DOE low-level radioactive waste sites have performed tritium migration tests.

Mr. Fazio. What is the purpose of these DOE studies, and how have the results been used?

Admiral Guimond. Generally the results have been used to determine regulatory compliance of the DOE facilities.

Mr. Fazio. If DOE sites are allowed to operate while such tests are ongoing, is there a reason the State of California should be prevented from doing likewise?

Admiral Guimond. It is not the Department of Energy's position that California should be prevented from performing tritium migration studies during operation of a low level radioactive waste facility. At the same time, it is up to DOI to determine what analysis to undertake before transferring land that is under its management.

WARD VALLEY

Mr. Fazio. Should the Ward Valley project be terminated as a result of Interior's actions, what practical effect do you believe this would have on implementation of the federal LLRW Policy Act in California and other States?

Admiral Guimond. We hope the Ward Valley project will go forward, and we cannot speculate about the effect if it were terminated.

WARD VALLEY

Mr. Fazio. Is DOE willing to accept for disposal commercial LLRW from waste generators in States unable to provide for LLRW disposal due to actions by the Federal government?

Admiral Guimond. No preparations have been made for DOE to accept low-level radioactive waste from waste generators in States that are unable to provide for state-sponsored disposal. Given the constraints on the Department's budget and facilities and the absence of appropriated funds for that purpose, it would not be possible for DOE to undertake such a task at this point in time.

Mr. Fazio. How would DOE seek to involve the Governors of such States in such processes?

Admiral Guimond. Should DOE receive such a request preceded by the necessary statutory changes to make DOE responsible for commercially generated low-level radioactive waste, the same mechanisms established over many years with the Governors of States hosting DOE facilities would be utilized to begin consultation.

WARD VALLEY

Mr. Bilbray. Given your 12/15/95 response to Senator Boxer, has the Energy Department agreed to oversee these proposed tests at the request of DOI, and in the absence of such a request by the State of California?

Admiral Guimond. We have indicated to the Department of Interior that, given the necessary funding and an appropriately defined scope of work, the Department could undertake the testing DOI seeks. We would perform that work as work for others under the Economy Act or the Atomic Energy Act. This response to DOI is consistent with the 12/15/95 letter to Senator Boxer, which indicated that, under the Low Level Radioactive Waste Policy Act, our only authority to provide technical assistance is in response to requests from States and Compacts.

Mr. Bilbray. Does the Department intend to request FY 1997 funds for these tests? If not, will funds be reprogrammed from elsewhere in its budget? If so, from where in the budget?

Admiral Guimond. We have advised DOI that we would need to be reimbursed for the tests.

WARD VALLEY

Mr. Bilbray. The DOI press release states on Page 2 that "The Department had previously offered the State of California a transfer of the land with formal legal conditions built into the transfer that would make the NAS recommendations binding and enforceable. The State of California has officially objected to the Department's conditions..."

The State has objected to a provision of the Administration's "offer" which would vest the Interior Department with a unprecedented and unauthorized oversight role of the proposed low-level waste facility. Would such a role be acceptable to the Department of Energy?

Admiral Guimond. DOE is not familiar with the oversight role DOI has proposed to California. DOE itself would not be an appropriate party to exercise oversight of activities on federal lands managed by DOI, nor have we been asked to play such a role.

WARD VALLEY

Mr. Bilbray. Legislation has been introduced in both the House and Senate which would transfer the land needed for the disposal facility from the Interior Department to the State of California, contingent upon provision of a written commitment by the State of California to the Nuclear Regulatory Commission to "carry out environmental monitoring and protection measures based on recommendations of the National Academy of Sciences subject to federal oversight by the Nuclear Regulatory Commission."

Given the requirements for this legislation, and the pledge made by the State of California to comply with the NAS recommendations, would such a role for the NRC comport with the traditional division of responsibility between the Energy Department, the NRC, and the states relating to low-level radioactive material?

Admiral Guimond. No. The respective roles you describe depart in some respects from what DOE understands to be the traditional division of responsibility between NRC and the States. Under the Agreement State provisions of the Atomic Energy Act, the NRC sets generally applicable requirements and standards for States that choose to maintain their own radiation protection programs. The NRC conducts scheduled audits of the State programs to assure that they comply with these standards. Agreement States are responsible for licensing. In that respect, the proposed legislation would depart from the traditional division of responsibility between the State and NRC under NRC's Agreement State Program. As noted above, DOE's principal role under the Low Level Radioactive Waste Policy Act is to provide technical assistance to States. That role would not be affected by the proposed legislation.

DEPARTMENTAL ADMINISTRATION REALLOCATION OF PRIOR YEAR BALANCES

Mr. Myers. Please provide at the Congressional level of detail a table showing the Departmental Administration appropriation account after the reallocation of prior year balances in FY 1996.

Mr. Vivona. The Departmental Administration account has been adjusted to reallot prior year balances in FY 1996 which I would like to provide for the record. This table is representative of what will be provided to you in the April base table. (The information follows:)

DEPARTMENTAL ADMINISTRATION 04/18/96
FY 1996 BASE TABLE LEVEL
(Dollars in thousands)

ADMINISTRATIVE OPERATIONS	FY 1996			FY 1997
	Appropriated	Prior Year Balances	Adjusted	Cong Request
Office of the Secretary	$2,500	$852	$3,352	$2,850
General Management				
Personnel Compensation & Benefits	185,000	3,099	188,099	119,647
Other Expenses				
Travel	4,820	712	5,532	2,827
Contractual Services/Capital Equipment	152,180	4,374	156,554	80,777
Subtotal, Other Expenses	157,000	5,086	162,086	83,604
Subtotal, General Management	342,000	8,185	350,185	203,251
Program Support				
Policy Analysis & System Studies	2,900	101	3,001	3,493
Minority & Economic Impact	2,900	207	3,107	2,900
Consumer Affairs	40	22	62	40
Public Affairs	50	1	51	65
Laboratory Cooperative Science Centers	0	34	34	0
International Policy Studies	0	18	18	0
Environmental Policy Studies	4,000	81	4,081	4,928
Scientific & Technical Training	1,000	42	1,042	1,000
Indian Affairs	0	15	15	0
Subtotal, Program Support	10,890	521	11,411	12,426
Subtotal, Administrative Operations	**355,390**	**9,558**	**364,948**	**218,527**
Cost of Work	20,826	17,484	38,310	24,336
CRADA	2,000		2,000	2,000
Subtotal, Cost of Work	22,826	17,484	40,310	26,336
Offset 1/			(11,519)	
Dept Admin, Obligational Authority	**378,216**	**27,042**	**393,739**	**244,863**
Offset 1/	(11,519)			0
Dept Admin, Appropriation	**$366,697**			**$244,863**

1/ Reflects use of prior year balances from the Cost of Work for Others Program ($11,269), Chief Financial Officer ($196), and Economic Impact & Diversity ($54).

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF CIVIL RIGHTS AND DIVERSITY

Mr. Myers. Please identify all Headquarters organizations that are set up to deal with any type of federal employee, contractor employee, or minority employee issues.

Mrs Moody. The Office of Economic Impact and Diversity was created in June 1993 to advise and lead diversity strategies which ensure full participation of all employees; to create full partnerships with small and disadvantaged businesses and minority educational institutions; in addition to fulfilling the legislative mandates of the components of the Office. The following offices within the Office of Economic Impact and Diversity were established to address various types of employee issues:

The Office of Civil Rights and Diversity directs the Department's affirmative employment programs by assuring a diverse work force and equal opportunity for minorities, women and persons with disabilities; counsels employees about unlawful employment discrimination and processes complaints and provides for special emphasis program activities by sponsoring commemorative and educational programs, and promoting cultural awareness, monitors the compliance of the Department's contractors and laboratories with Federal civil rights laws; enforces Federal civil rights laws in programs receiving financial assistance from the Department; and gathers and disseminates statistical information on the Department's compliance with applicable civil rights statutes and regulations. The Office also is responsible for the Department's Employee Concerns Program, designed to address issues primarily related to health and safety of contract employees.

The Office of Ombudsperson provides an opportunity for employees and stakeholders to confer with a neutral designee to discuss concerns, recommendations, and complaints perceived to interfere with work, productivity or morale prior to initiating grievance procedures.

Additionally, the following offices also address Federal or contractor and minority employee issues:

The Office of Dispute Resolution is located in the Office of General Counsel and addresses Federal and contractor employees issues

The Office of Contractor Employee is located in the Office of Inspector General and address only contractor employee issues.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

Mr. Myers. What is the FTE size and funding of each office in fiscal years 1995, 1996 and 1997?

Mrs. Moody. Three Programs are funded as one Office budget.

ECONOMIC IMPACT AND DIVERSITY

	FY 1995	FY 1996	FY 1997
Total FTEs	51	50	49
	($ Thousands)		
Total Appropriation	$7,276	$6,630	$7,736

OFFICE OF CONTRACTOR EMPLOYEE PROTECTION

Total FTEs	FY 1995	FY 1996	FY 1997
	15	14	12
Total Appropriation	1.4 million	1.3 million	1.1 million

OFFICE OF DISPUTE RESOLUTION

	FY 1995	FY 1996	FY 1997
Total FTEs	1	1	1
Total Appropriation	0	0	0

DEPARTMENTAL ADMINISTRATION PERSONNEL COMPENSATION AND BENEFITS

Mr. Myers. For (1) Human Resources, (2) Congressional, Public, and Intergovernmental Affairs, and (3) the Office of Policy, provide an analysis of the salaries and benefits for fiscal years 1996 and 1997 which provides a detailed explanation of each item which contributed to the overall significant increase in salaries and benefits costs.

Mr. Vivona. The Departmental Administration salaries and benefits account was significantly reduced in FY 1996. The funding level forced DOE management to take several actions to deal with the shortfall, including maximum use of the buyout program, major reductions in overtime spending, elimination of employee cash awards and bonuses, continuation of a blanket hiring moratorium, limited involuntary separations, and up to 48 hours of unpaid furlough for employees. As of mid-fiscal year, the Departmental Administration accouhnt has made very good progress in addressing its spending and staffing reduction requirements. Because of this progress, we have deferred all but 16 hours of employees' furlough requirement until further notice.

Human Resources and Administration requirement for budget authority increases by $2.0 million. Changes in payroll funding include: sixty seven fewer full time equivalents, salary and benefit savings (-$4.6 million); and fewer buyouts (-$0.5 million); offset by one time use of prior year balances in FY 1996 ($1.2 million); pay raise ($2.5 million); restoration of awards and overtime ($2.1 million); one time furlough savings in FY 1996 ($1.2 million); and other ($0.1 million).

Congressional, Public, and Intergovernmental Affairs requirement for budget authority increases by $1.0 million. Changes in payroll funding include: eleven fewer full time equivalent employees, -$.6 million salary and benefits, and greater number of buyouts, +$.3 million; one time use of prior year balances in FY 1996, +$.3 million; one time furlough savings in FY 1996, +$.2 million; restoration of awards and overtime +$.3 million; and pay raise, +$.5 million.

The Office of Policy requirement for budget authority increases by $1.2 million. Changes in payroll funding include: eleven fewer full time equivalent employees, -$.7 million salary and benefits; one time use of prior year balances in FY 1996, +$.3 million; one time furlough savings in FY 1996, +$.3 million; restoration of awards and overtime +$.5 million; and pay raise, +$.8 million.

The following table is provided to help clarify the payroll increases from FY 1996 to FY 1997.

DEPARTMENT OF ENERGY
DEPARTMENTAL ADMINISTRATION
FY 1996 CONGRESSIONAL REQUEST
($ MILLIONS)

Human Resources and Administration

	FY 1996 Comparable	FY 1997 Request	$ Changes
Salaries	45.4	40.7	(4.7)
Overtime	0.8	1.7	0.9
Awards	0.0	1.2	1.2
Benefits	7.6	7.7	0.1
Buy outs \1	1.8	1.3	(0.5)
Pay Raise	0.0	2.5	2.5
Other \1	1.1	1.2	0.1
Furlough Savings \1	(1.2)	0.0	1.2
Subtotal	55.5	56.3	0.8
Adjustment	(1.2)	0.0	1.2
Budget Authority	54.3	56.3	2.0
Salary Expense	53.8	53.8	0.0
Full Time Equivalent	842	775	-67
Salary$K/FTE	63.9	69.4	5.5

Congressional, Public, and Intergovernmental Affairs

	FY 1996 Comparable	FY 1997 Request	$ Changes
Salaries	7.1	6.7	(0.4)
Overtime	0.0	0.1	0.1
Awards	0.0	0.2	0.2
Benefits	1.2	1.0	(0.2)
Buy outs \1	0.2	0.4	0.2
Pay Raise	0.0	0.5	0.5
Other \1	0.0	0.0	0.0
Furlough Savings \1	(0.2)	0.0	0.2
Subtotal	8.3	9.0	0.7
Adjustment	(0.3)	0.0	0.3
Budget Authority	8.0	9.0	1.0
Salary Expense	8.3	8.6	0.3
Full Time Equivalent	110	99	(11)
Salary$K/FTE	75.5	86.5	11.0

Office of Policy

	FY 1996 Comparable	FY 1997 Request	$ Changes
Salaries	12.1	11.5	(0.6)
Overtime	0.0	0.1	0.1
Awards	0.0	0.4	0.4
Benefits	2.4	2.3	(0.1)
Buy outs \1	0.4	0.4	0.0
Pay Raise	0.0	0.8	0.8
Other \1	0.4	0.4	0.0
Furlough Savings \1	(0.3)	0.0	0.3
Subtotal	15.0	15.9	0.9
Adjustment	(0.3)	0.0	0.3
Budget Authority	14.7	15.9	1.2
Salary Expense	14.5	15.1	0.6
Full Time Equivalent	183	172	(11)
Salary$K/FTE	79.2	87.8	8.6

/1 These items are fixed costs not related to FTE levels, as such, not related to employment compensation. They are not computed in the Cost per FTE.

DEPARTMENTAL ADMINISTRATION PERSONNEL COMPENSATION AND BENEFITS

Mr. Myers. Also, the average FTE cost for (2) and (3) above are considerably higher than many other DOE-Headquarters organizations, please explain.

Mr. Vivona. The average FTE cost by office in the FY 1997 Congressional Budget Request for Departmental Administration includes Personnel Compensation and Benefits, Travel, Support Services, and Other Related Expenses. The explanation for the average FTE costs for the Office of Congressional, Public, and Intergovernmental Affairs and the Office of Policy are as follows:

The Office of Congressional, Public, and Intergovernmental Affairs interacts on a daily basis with senior Departmental officials, Members of Congress and their staffs, members of the news media, Governors and their staffs, high ranking officials in our network of national labs and field offices, officials from other Federal agencies and departments as well as the private sector. The inherent nature of the function requires higher, policy-level grades. This office includes senior level professional employees with many years of seniority and experience and very few clerical or support staff which are at a lower FTE cost which in turn causes a higher grade average. Advanced information technology allows the professionals to accomplish more with less clerical support through our utilization of computers, e-mail, and voice mail.

As part of the Department's downsizing effort, the Office of Congressional, Public, and Intergovernmental Affairs has reduced its overall staffing for the combined offices from 118 FTEs in FY 95 to 99 FTEs in FY 97, a total reduction of 19 positions.

The budget request provides needed flexibility to allow for the proper mix of employees to accomplish the Office's mission in a downsizing environment.

The Office of Policy's average FTE cost estimate reflects the unique inclusion of administrative overseas costs reimbursed to the Department of State in "Other Related Expenses" (specifically, reimbursement to the State Department for overseas offices in Tokyo and Moscow), costs associated with support staff (foreign service nationals) at the two embassy locations, and international travel requirements associated with the Department's international affairs responsibilities to develop and implement international energy/environmental policy and to represent the Department and the U.S. Government as members of international energy and environmental organizations, and costs associated with support staff (foreign service nationals) at the two embassy locations.

BUYOUT FUNDING IN THE DEPARTMENTAL ADMINISTRATION ACCOUNT

Mr. Myers. Funding of $3M is proposed for buyouts of 65 employees, which is an average of $46,154 per employee. Provide a detailed explanation of this cost.

Mr. Vivona. The FY 1997 Congressional Budget Request for 65 buyouts in the Departmental Administration account is actually $2 6M, which is an average cost of $40,000 per employee. The $3.0M figure in the Departmental Administration Executive Summary section of the FY 1997 Congressional Budget Request reflects rounding. The cost of a buyout includes the cost of the buyout (maximum $25,000), the cost of payment for annual leave at the time of separation, and the 9% surcharge required to the Civil Service Retirement System for buyouts given to employees taking an early retirement.

Mr. Myers. How many employees (in the DA account) took buyouts and what was the cost of the buyouts in fiscal years 1995 and 1996?

General Durham. There were 109 buyouts in the Departmental Administration account in FY 1995 for a total cost of $3.7M and 114 buyouts in the Departmental Administration account so for in FY 1996 for a total cost of $4.0M.

DEPARTMENTAL ADMINISTRATION STAFFING

Mr. Myers. FTE levels in this account exceed the Strategic Alignment Initiative targets for FY 1996. Why has this happened? What are the penalties for this?

General Durham. The difference between the Strategic Alignment Initiative targets and the FY 1996 full-time equivalent levels for the Departmental Administration account occurs because the targets and full-time equivalent levels are two different units of measure. The Strategic Alignment Initiative targets are end-of-year employment counts while the full-time equivalent levels requested for this account reflect the projected number of staff years that will be expended by all of the employees in the Departmental Administration account over the course of the fiscal year.

The Department started fiscal year 1996 with 2,892 employees in the Departmental Administration account. As of March 16, 1996, there were 2,686 employees in the account. Thus, the Department has realized significant reductions in employment. However, the hours worked by these employees prior to their departure will be reflected in the Department's actual FTE usage for the year. To illustrate, an organization that began the fiscal year with 300 employees and ended the year with 225 employees would be estimated to utilize approximately 263 full-time equivalents.

The Department remains committed to attaining the fiscal year 1996 Strategic Alignment Initiative targets, and organizations that have not yet done so are being closely monitored. Management actions for ensuring attainment of the targets include managed attrition, buy-outs, and the hiring moratorium that was instituted in May 1995.

OFFICE OF THE SECRETARY SUPPORT SERVICES

Mr. Myers. Where are support services for the Office of the Secretary funded?

Mr. Vivona. The Office of the Secretary's FY 1997 Congressional Budget Request includes funding for salary and benefits, travel (including security detail), and training for 24 full time equivalents, but does not include funding for support service contracts. However, the Office of the Secretary does receive support from the Office of Human Resources and Administration, for example, computer support, logistical services, communication systems, and administrative type activities.

Mr. Myers. What are these activities and expenses in fiscal years 1994, 1995, and estimated for 1996 and 1997?

Mr. Vivona. The Office of the Secretary does not have support service contracts; however, the budget does provide funding for employee training and development activities for 24 full time equivalents and a one time expense in FY 1996 involving public affairs services in support of public media affairs. The following table reflects the enacted funding levels for fiscal years 1994 through 1997.

	FY 94	FY 95	FY 96	FY 97
Support Service Contracts	-0-	-0-	-0-	-0-
Training	$7K	$7K	$ 6K	$6K
Public Affairs Service			$44K	

ASSET SALES

Mr. Myers. With the Department embarking on a major "sale of assets" program, provide details relative to how the department plans to disposition the projected revenues accruing from the sale of assets. To the extent that the Department contemplates varying treatments of projected revenue streams, describe the planned methods for revenue disposition.

Secretary O'Leary. For asset sales that come under the Department's Asset Sales Initiative, net proceeds; i.e., gross proceeds received from the sale less the costs related to the sale, will be deposited to Treasury as miscellaneous receipts. For asset sales not falling under the Asset Sales Initiative, we will continue to treat them as follows. Revenue from DOE assets sold by federal personnel is returned to the Treasury in accordance with the requirements of the Federal Property and Administrative Services Act of 1954 (recodified as 40 U.S.C., Section 485). Except for revenue received from the sale of timber at Savannah River, which is budgeted for in the Departmental Administration Appropriation, revenue from sales of DOE assets sold by DOE's cost-type contractors in the normal course of operations is used as an offset to allowable costs under the contracts in accordance with 40 U.S.C. 485(e) and applicable provisions contained in the contracts.

APPROPRIATION LANGUAGE

Mr. Myers. There are many instances where the total appropriation funding included in the Department's FY 1997 detailed budget justifications does not agree with the requested appropriation language included in the President's budget appendix. Please review each appropriation account and reconcile the differences. Identify specific program adjustments which need to be made in the Department's detailed budget justifications to make them agree with the President's budget request. Since no other agency under the jurisdiction of this Subcommittee had a similar problem, please explain why the Department failed to coordinate appropriation funding totals with OMB.

Mr. Vivona. At the time of the initial galley submission to OMB there were many funding issues remaining to be resolved. Under normal circumstances (all previous years) OMB has always been able to let the Department have a second or third opportunity to review the appropriation language galley before it went final to the printer. Because of the time schedule, the Department did not have an opportunity to make even a second review of the galley materials. The analysts at OMB had exceedingly limited time on a weekend to do a final review of the galley materials. This review was complicated by the fact that in the FY 1997 budget OMB had begun to maintain its database in millions of dollars, rather than thousands of dollars, which had been the case heretofore. While DOE continued to maintain the budget data in thousands of dollars, the OMB analysts did not have this information available to them during their final review. The Department regrets this inconvenience to the Committee, but urges the Committee to rely on the amounts included in the Department's justification materials as more accurately reflecting the details of the Administration's proposal. For Energy and Water appropriations the difference between the Department's justifications and the budget appendix only amount to $109 thousand and thus has no material impact on the overall FY 1997 budget proposal.

UNCOSTED BALANCES

Mr Myers. Please provide the Department's annual report on uncosted balances.

Mr. Vivona. The report is still in preparation but will be provided no later than the end of April. Draft versions of the report indicate that total Departmental uncosted non-reimbursable balances for M&O contractors fell by 22% from the end of FY 1994 to the end of FY 1995. Similar uncosted balances for the Energy and Water appropriation fell by 24% over the same period.

UNCOSTED BALANCES

Mr. Myers. Provide detail on ending fiscal year 1995 uncosted balances as well as projected fiscal year 1996 uncosted balances by major element within each program. In some level of summary, describe how much of the uncosted balances represent genuine commitments to the Department (that is, encumbrances to vendors or for "in house labor", authorized work scope, etc.). Conversely, identify those portions of uncosted balances which cannot be supported as an encumbrance or other "hard" commitment. To the extent that significant downward trends are not shown, explain why expected declines are not occurring.

Mr. Vivona. Much of this information will be provided in the Department's FY 1995 annual uncosted report. This report is still in preparation but will be provided no later than the end of April. However, some of the requested information is provided below.

It should be noted that through discussions with representatives of the General Accounting Office, it has been concluded that the split of unencumbered amounts into approved work scope, prefinancing, and remaining unencumbered had not proved to be as useful in understanding uncosted balances as had been hoped. Therefore, the Department is moving away from using these categories in favor of evaluating unencumbered amounts against standard goals. A draft GAO report contains these same conclusions and recommends establishment of these standard goals.

DOE has made significant progress in reducing uncosted funding (uncosteds). Total DOE uncosteds (not including reimbursable funds from outside the Department) are down 11% from end of FY 1994 to end of FY 1995. Uncosteds for programs funded by E&WD are down 16% over the same period. The five largest E&WD appropriations accounts, representing over 90% of E&WD funding, all decrease as follows: Defense Environmental Restoration & Waste Management (ERWM) is down 31%; General Science is down 27%; Weapons Activities are down 22%; Other Defense Activities are down 9%; and Energy Supply is down 1%. Total DOE M&O uncosteds fall by 22% over the same period. Over the period of FY 1992 to FY 1995, total DOE M&O uncosteds are down by fully 35%. DOE will continue to review uncosted balances and to work to keep them at the proper minimum.

WORK FOR OTHERS PROGRAM

Mr. Myers. The Department provides specialized services to other Federal agencies through the reimbursable Work for Others Program. What is the dollar level involved with these reimbursable activities in fiscal year 1995, 1996, and estimated for 1997?

General Durham. The Department performed $1.1 billion dollars of work for other Federal agencies in FY 1995. The Department estimates that the dollar levels for work performed for other Federal agencies under the Work for Others Program to be $1.2 billion in FY 1996 and $1.2 billion in FY 1997.

Mr. Myers. Please describe the nature of the work involved and the other agencies requesting the work.

General Durham. The Department is currently performing two to three thousand Work for Others projects which cover a broad spectrum of activities for various Federal agencies. The nature of these projects include: high performance computing and applications, environmental research and pollution minimization, micro electronics, energy and biotechnology research, precision engineering and advanced manufacturing, as well as munitions and systems integration. Federal agencies for which DOE currently performs these and other activities include, but are not limited to, the Department of Defense, Environmental Protection Agency, Health and Human Services, National Institutes of Health, National Aeronautics and Space Administration, and the Nuclear Regulatory Commission. Work for Others Program policy requires a DOE Contracting Officer to certify that each project is consistent with or complementary to the Department's missions and the mission of the facility where the work will be performed.

PAYMENTS IN LIEU OF TAXES

Mr. Myers. Describe by state (and field element within each state) all cases where the Department makes (and has made) payments in lieu of taxes.

Mr. Vivona. The following table lists the states, field elements and the local governments that are (and have been) affected by payments in lieu of taxes.

STATE	FIELD ELEMENT (FACILITY)	LOCAL GOVERNMENT
Florida	(Pinellas Peninsula Plant)	• Pinellas County
South Carolina	Savannah River Operations Office (Savannah River Complex)	• Allendale County • Barnwell County • Aiken County
Pennsylvania	(Bettis Atomic Power Laboratory)	• Allegheny County • Borough of West Mifflin • West Mifflin Area School District
Illinois	Chicago Operations Office (Argonne National Laboratory)	• DuPage County
California	Oakland Operations Office (Livermore Laboratory Complex)	• Livermore Valley Joint Unified School District
Colorado	Rocky Flats Operations Office (Rocky Flats Nuclear Weapons Plant)	• Jefferson County (and School District) (application pending for PILT)
Ohio	Ohio Field Office (Fernald Feed Materials Production Center)	• Hamilton County (appln. pending)
Ohio	Ohio Field Office (Mound Facility)	• Montgomery County (appln. pending for PILT & special burdens)

PAYMENTS IN LIEU OF TAXES

STATE	FIELD ELEMENT (FACILITY)	LOCAL GOVERNMENT
Ohio	Oak Ridge Operations Office (Portsmouth Gaseous Diffusion Plant)	• Pike County and entities
Washington	Richland Operations Office (Hanford Complex)	• Franklin County (appln. pending) • Benton County (appln. pending) • Grant County
Kentucky	Oak Ridge Operations Office (Paducah Gaseous Diffusion Plant)	• McCracken County Public Schools
New York	(Niagara Falls Storage Site)	• Town of Lewiston • Lewiston-Porter Central School District • Niagara County
Tennessee	Oak Ridge Operations Office (Oak Ridge Complex)	• City of Oak Ridge • Anderson County • Roane County
New Jersey	(Middlesex Sampling Plant)	• Borough of Middlesex
New Jersey	(Wayne Interim Storage Site)	• Township of Wayne (application pending for PILT)
Texas	(Pantex Facility)	• Carson County (application pending for PILT)

Mr. Myers. What is the Department's policy on this program?

Mr. Vivona. The Department's policy on making PILT payments is contained in draft DOE Order 2100.12A, of June 9, 1992, (copy attached) as modified by Acting Chief Financial Officer memorandum dated March 14, 1994, which made the following changes:

- Eliminated the gross benefits test which had been used to determine threshold eligibility for payments

- Eliminated the requirement to offset payments by the direct benefits a community receives (except for duplicate Federal payments identified for the same discrete purposes

- Clarified the land valuation process to state that current tax rates and assessments may be used for calculating new and revised payments and property valuations based on the

highest and best use within classifications.

The Acting CFO's March 14, 1994, memorandum also stated that other current policies; [i.e., those contained in draft DOE Order 2100.12A, of June 9, 1992] are to be continued.

Mr. Myers. What is the magnitude of future program costs?

Mr. Vivona. If PILT payments were paid to all communities that are eligible to receive these payments[1], future annual costs are estimated to be approximately $15 million. The March 14, 1994, revision to DOE's PILT policy; i.e., making payments based on the highest and best use of the properties (excluding government-financed improvements) regardless of the properties' classification when acquired, could result in increasing future annual payments by $10 million over and above current projections. These future costs do not include **payments equal to taxes** that will be made by the Office of Civilian Radioactive Waste Management.

[1]Although approximately 49 communities are eligible for PILT payments under the Atomic Energy Act of 1954, as amended, only 26 had applied as of the end of 1993, and of those 26, only 16 were approved.

U.S. Department of Energy

Washington, D.C.

ORDER

DOE 2100.12A

6-9-92

SUBJECT: PAYMENTS FOR SPECIAL BURDENS AND IN LIEU OF TAXES

1. PURPOSE. To establish the Department of Energy policy for making payments in lieu of taxes to certain State and local governments under the provisions of Title 42, United States Code (U.S.C.), Section 2201 et. seq., and Section 2208 of the Atomic Energy Act of 1954, as amended.

2. CANCELLATION. DOE 2100.12, PAYMENTS FOR SPECIAL BURDENS AND IN LIEU OF TAXES, of 11-16-87.

3. EXCLUSIONS. This Order does not apply to sites: where payments are made to State and local governments under the Atomic Energy Community Act of 1955, as amended; the Uranium Mill Tailings Radiation Act of 1978, as amended; or the Nuclear Waste Policy Act of 1982.

4. REFERENCES.

   a. Atomic Energy Act of 1954, as amended, 42 U.S.C. 2201 et. seq., and 2208, which provides for payments in lieu of taxes to State and local governments.

   b. Atomic Energy Community Act of 1955, as amended, 42 U.S.C. 2301 et. seq., and 2391, which provides for payments to communities to facilitate an orderly transition from Federal to local control.

   c. Nuclear Waste Policy Act of 1982, 42 U.S.C. 10199, which provides for payments equal to taxes to jurisdictions affected by proposed or selected nuclear waste sites.

   d. Uranium Mill Tailings Control Act of 1978, as amended (Public Law 95-604), 42 U.S.C. 7901 et. seq., and 7942 which authorizes a program of assessment and remedial action at inactive uranium mill tailings sites.

   e. Public Law 81-874, 20 U.S.C. 631-647, which provides for payments to Federally impacted school districts.

   f. Office of Management and Budget Circular A-34, "Instructions on Budget Execution," of 8-26-85, which contains instructions relating to apportionments and reports on budget execution.

DISTRIBUTION:
All Departmental Elements

INITIATED BY:
Office of Chief Financial Officer

5. DEFINITIONS.

a. Any Benefit is used in determining eligibility for payments in lieu of taxes and the amount to be paid based on special burdens incurred by a State or local government. Any benefit includes all benefits accruing to the State or local government by reason of the Department's activities at the site being considered under a request for payment based on special burdens. The benefits and burdens used to determine payments based on claims of special burdens will be determined on a case-by-case basis.

b. Payments in Lieu of Taxes are discretionary payments made to render financial assistance to those States and local governments in which the Department or one of its predecessor agencies has acquired property previously subject to State or local taxation and on which the Department carries on activities authorized by the Atomic Energy Act of 1954, as amended.

c. Property in the Condition it was Acquired is the physical description/definition and classification of the subject real property used to determine the real property's assessed valuation the last year the property was on the tax rolls prior to being acquired by the Government.

d. Property Eligible for Payments in Lieu of Taxes are real properties that are currently used for activities authorized by the Atomic Energy Act of 1954, as amended, that were on the tax rolls immediately prior to being acquired by the government. In cases where activities are carried on that may create payments to State and local governments, based on legislation other than the Atomic Energy Act, such as the Nuclear Waste Policy Act, those parcels of land used for such other purposes shall be excluded from the computation of a payment in lieu of taxes, as prescribed by Section 168 of the Atomic Energy Act of 1954, as amended.

e. Property Tax Loss to State or local government is considered to be taxes that would have been payable on such real property, based on the condition of the property when acquired by the Government.

f. Revised Payments are proposed changes in payments that are based on a reclassification of the land to a new tax category, an increase or decrease in the amount of the land used to compute the payment, or other major changes in the method of computing the payments. Changes in the amounts to be paid that are based on jurisdiction wide adjustments to tax assessments or tax rates are not considered to be revised payments.

g. Special Burdens are unusual or substantial burdens placed on a State or local government by Atomic Energy Act related activities of the Department. Special burdens are incurred by extraordinary services that are not normally required by a community on a

routine basis. The mere fact that a State or local government is burdened by the activities of the Department does not constitute a special burden.

h. Taxing Authority is an entity empowered to render a separate tax bill based on the value of real property.

6. BACKGROUND. The Atomic Energy Act of 1954 gives the Secretary of Energy (S-1) broad authority in making payments in lieu of taxes. The amount, the timing, and the terms of the payments are at the discretion of the Secretary. The only limits contained in the Act are that the Department shall be guided by the policy of not making payments in excess of the taxes that would have been payable for such property in the condition in which it was acquired, except in cases where special burdens have been cast upon the State or local government by reason of activities of the Department or its agents. In such cases, any benefit accruing to the State or local government by reason of such activities shall be considered in determining the amount of the payment.

7. POLICY.

a. Only designated properties are eligible for support payments in lieu of taxes. To be eligible, the property must currently be used for activities authorized by the Atomic Energy Act of 1954, as amended, and must have been on tax rolls immediately prior to being acquired by the Government.

b. If it is demonstrated that the imputed tax loss is greater than the benefits derived from the Department's activities, the amount of the payment to be made in lieu of taxes shall be calculated by applying the current tax rate to the current assessed valuation of the property in the condition in which it was acquired and reducing the result of that calculation by the value of direct tax benefits that accrue to the community as a result of the Department's activities. The direct tax benefits that accrue to a community as a result of the Department's activities include payments to federally impacted school districts under Public Law 81-874, and sales, franchise, inventory use, or other taxes levied on the Department or its contractors by State or local taxing jurisdictions. This test and calculation of amounts to be paid are required only for new or revised payments. They are not required for continuing payments approved in prior years.

c. The Department shall not make retroactive payments in lieu of taxes.

d. Payments that have been approved will begin when funds have been appropriated for that purpose and are contingent on funds being available for such purposes. Furthermore, the amounts available

for such payments are subject to the same reductions or other budgetary restrictions that may be applied to other Departmental programs.

e. New or revised payments in lieu of taxes and payments based on special burdens require the advance approval of the Chief Financial Officer (CR-1).

f. Payments in lieu of taxes being made at the time this Order is approved shall continue under the existing terms and conditions until a specific request to change the basis of the payment is received. Such requests shall be considered the same as new requests.

g. Payments in lieu of taxes shall be made only after a valid and binding release or settlement of claims for payments related to the Department's land or property is obtained from the taxing authority.

h. Payments shall be suspended when a taxing authority asserts a claim through the courts for real property taxes or their equivalent. If the courts rule in favor of the plaintiff, payments will be made in accordance with the terms set by the court, but no retroactive payment will be made for the period during which the tax was contested unless so directed by the court.

i. Nothing in this Order modifies the discretionary authority given to the Secretary by Section 168 of the Atomic Energy Act of 1954, as amended, and such payments are not construed as entitlements.

j. All payments in lieu of taxes must be supported by a duly executed intergovernmental agreement. This agreement serves as the obligating document.

k. This Order does not affect existing agreements between DOE and State and local governments that preclude payments in lieu of taxes on all or part of real property owed by the Department.

l. Payments in lieu of taxes made by the Department shall not exceed the tax payment had the real property remained on the tax rolls in the condition it was acquired unless the payment is based on a special burden.

m. Payments in lieu of taxes will not be made where other, direct or indirect, Federal payments are made to the taxing jurisdiction that are based on the activities of the Department or other Federal agencies carried out on DOE property, e.g., payments levied on DOE contractors that are tantamount to property taxes.

n. Once authorized, payments shall continue subject to the availability of funds or modifications by intergovernmental agreement.

8. RESPONSIBILITIES.

a. Chief Financial Officer (CR-1) shall:

(1) Authorize, for the Secretary, new and revised payments in lieu of taxes;

(2) Develop and update, as required, Departmental policies and procedures related to making payments in lieu of taxes;

(3) Ensure that funding for approved payments in lieu of taxes, as requested by the cognizant Program Secretarial Officer (PSO), is included in the Department's budget submission to OMB and to Congress; and

(4) Ensure that appropriated and apportioned funds for payments in lieu of taxes are properly allotted.

b. Director of Administration and Human Resource Management (AD-1), through the Office of Organization, Resources and Facilities Management (AD-10), shall:

(1) Maintain an inventory and description of Departmental real estate that is subject to the provisions of Section 168;

(2) Independently review requests for new and revised payments in lieu of taxes for accuracy, completeness, and reasonableness and recommend concurrence or nonconcurrence to CR-1; and

(3) Provide advice and consultation to CR-1 based on the independent review of new and revised payment requests and recommendations received from PSOs.

c. General Counsel and Field Counsel shall:

(1) Review and concur or nonconcur on the eligibility of the State or local government or taxing authority requesting payments in lieu of taxes to receive such payments; and

(2) Provide legal advice on other matters that should arise relating to payments in lieu of taxes.

d. Managers of DOE Field Offices shall:

(1) Manage the administration of existing payments;

(2) Analyze requests for new or revised payments;

(3) Prepare recommendations on new or revised payments and submit the recommendations to the cognizant PSO which is responsible for budgeting for the payment; and

(4) Ensure that payments in lieu of taxes are made in accordance with duly executed intergovernmental agreements.

e. Cognizant Program Secretarial Officers shall:

(1) Review and forward recommendations regarding applications for new and revised payments in lieu of taxes to CR-1; and

(2) Ensure that funding for approved payments is included in their budget submissions.

9. PROCEDURES.

a. Requests for revised or new payments in lieu of taxes, not based on an analysis of special burdens versus any benefits, are handled as follows:

(1) The cognizant DOE Field Office will review these requests to ensure that the requests comply with Departmental policy. The requests should describe the basis for computing amounts claimed and at least contain the following information:

(a) Description of property, including non-Federal government improvements at the time of acquisition and which still exist (initial requests only);

(b) Date removed from tax rolls (initial requests only);

(c) Federal agency initially acquiring property (initial requests only);

(d) Classification of property by taxing authority (if applicable) and zoning of property the last year it was on the tax rolls (initial requests only);

(e) Tax rate, assessment, and total payment in lieu of tax proposed;

(f) Current assessment placed on property of the same zoning and/or class, as reported under 9a(1)(d) above, by the taxing authority;

(g) Current tax rate applicable to the same class and/or zoning of property as reported under paragraph 9a(1)(d) above;

(h) The tax rate and assessment applied to similar properties elsewhere in the same tax jurisdiction;

(i) A description and valuation of all the benefits accruing to the community as a result of the Department's activities; and

(j) Information about payments received by the taxing jurisdiction(s) from the Federal governmental organizations that are based on the Department's property and activities.

(2) The cognizant DOE Field Office is responsible for evaluating the request and preparing a recommendation for action. The evaluation will include:

(a) A determination whether or not the subject property meets the criteria of eligibility for payments in lieu of taxes established by the Atomic Energy Act of 1954, as amended.

(b) An assessment of direct cash benefits to the taxing jurisdiction that are a result of the Department's activities. This will include payments to affected school districts, under Public Law 81-874 and 20 U.S.C. 631-647, and tax payments by DOE contractors to a State or local taxing authority that is requesting a new or revised payment in lieu of taxes. Other payments made by a DOE contractor that are based on property or equipment that are in lieu of taxes normally paid by a property owner will also be evaluated in recommending the amounts to be paid in lieu of taxes.

(c) An examination of the tax rate and assessment applied to similar properties elsewhere in the same tax jurisdiction to assure that payment requests are fair and consistent.

(d) A report of the assessment and recommendations forwarded to the cognizant PSO. The recommendations will be accompanied by workpapers and other information sufficient to support the recommendation made. The information will include:

1 Recommendation of approval or disapproval.

2 If approval is recommended:

a The amount to be paid;

b The date first payment is to be made;

c Legal opinion from field counsel containing an analysis of relevant facts and law regarding the eligibility of the property under the Atomic Energy Act of 1954, as amended; and

d A comparative analysis of the imputed tax loss and all benefits accruing to the community as a result of the Department's activities.

(3) Each request for new or revised payment will be reviewed by the cognizant PSO and forwarded to CR-1 with a recommendation.

(4) CR-1 will evaluate the recommendation in consultation with General Counsel and other staff, as appropriate, and determine if it is in the best interest of the Department to make the payment.

(5) When notified of approval by CR-1, the PSO will include funding for approved payments in the Department's next budget cycle.

(6) The cognizant procurement office will execute a separate intergovernmental agreement between the Department and each taxing authority designated to receive payments in lieu of taxes. The agreement will set forth the terms and procedures for billing, making payments, and revisions. The agreement must contain provisions that: (a) the payments are being conditioned on the availability of funds; (b) the date the first payment is due is indicated; and (c) explain that such funds are subject to legislative or administrative reductions in funding levels. Furthermore, agreements shall state that payments in lieu of taxes are not entitlements.

b. Requests for new or revised payments based on special burdens that are in excess of any benefits derived from the Department's activities by the taxing jurisdictions are reviewed by the cognizant DOE Field Office to assure that Departmental policies are complied with and that the requests are complete and adequately supported. At a minimum, requests shall contain the following information:

(1) The information described in paragraph 9a(1)(a) through 9a(1)(g);

(2) A description of special burden(s) incurred as a result of the Department's activities and the dollar cost of these burdens to the taxing jurisdiction; and

(3) Benefits derived from the activities of the Department. Such benefits include, but are not limited to, all local taxes paid by employees at the DOE site and economic activity created by DOE contractors and suppliers.

c. The evaluation of the requests and recommendations will follow the procedures outlined in paragraphs 9a(2) thru 9a(6).

d. Funds budgeted for payments in lieu of taxes must be specifically identified in the documentation supporting budget requests. Payments that have been approved will begin when funds have been appropriated for that purpose. In accordance with Office of Management and Budget Circular A-34, payments in lieu of taxes are recorded as an obligation in the period in which they are authorized to be paid and due.

BY ORDER OF THE SECRETARY OF ENERGY:

DONALD W. PEARMAN, JR.
Acting Director
Administration and Human
Resource Management

FERC EXCESS RECEIPTS

Mr. MYERS. Why is the Department now showing Federal Energy Regulatory Commission excess receipts as an offset for the total DOE funding, when those receipts have always been returned to Treasury?

Mr. VIVONA. The Federal Energy Regulatory Commission collects receipts to reflect the total government cost of its operations. The part of the receipts that corresponds to direct Federal Energy Regulatory Commission costs is used as an offset to the Federal Energy Regulatory Commission appropriation, while the remainder is returned to Treasury. Beginning with the FY 1996 Budget, the Office of Management and Budget directed the Department to reflect these excess receipts on its budget tables to emphasize that the full costs of Federal Energy Regulatory Commission operations are recovered in its fee structure and to give visibility to these amounts. The excess receipts are shown on these tables as proprietary receipts and will be returned to the Treasury General Fund.

OVERHEAD

Mr. Myers. The Department has made an issue of reducing overhead costs at DOE sites to provide cost savings. What progress has been made to date on this effort? Please quantify the savings which have been achieved through overhead reduction?

Mr. Vivona. The requested data is being collected and will be provided no later than the end of April. However, it is clear that the Department has achieved savings in overhead. One of the prime drivers of overhead costs is the number of contractors onsite who need to be supported or who themselves are charged via overhead. Contractor employment levels have dropped by 30,000 from those of the previous administration. This means that the marginal overhead costs associated with those personnel have been eliminated.

OVERHEAD

Mr. Myers. Please provide a table showing indirect and support-type (i.e., overhead and organizational burden) expenses by activity, operations office, by site, by contractor for fiscal years 1994, 1995, 1996 and estimated for 1997. Please show the components that comprise the accounts and then provide these cumulative expenses as a percent of the laboratory or site funding for each year.

Mr. Vivona. The most recent data available will be provided no later than the end of April. However, concerns have arisen within the Department that capturing only overhead and organizational burden costs does not adequately portray the full cost of operating a site, given that some portion of these costs can be charged direct. Therefore, a pilot effort is underway this year to collect data for the full functional costs of a site.

INTERNAL REPROGRAMMINGS

Mr. Myers. Please identify all internal reprogrammings which were approved by the Department in fiscal years 1994, 1995, and 1996, without prior Congressional notification. Provide a brief description and the source of funds.

Mr. Vivona. Requested information regarding the Department's internal reprogramming actions for FY 1994, FY 1995, and FY 1996 follows:

FISCAL YEAR 1994:

Weapons Activities. Reprogramming within the Stockpile Support program to provide $500,000 to project 85-D-115, Renovate Plutonium Building's Utility Systems, at Rocky Flats, to complete the approved scope of the Electrical Power System project. Source of funds is prior year project 91-D-122, Short-Range Attack Missile.

Energy Supply Research and Development Activities. Reprogramming of $140,000 of Test Reactor Area Hot Cells funding as capital equipment, in accordance with the budget justification for this activity.

Weapons Activities. Reprogramming of $838,000 from Core R&D operating expenses to Inertial Confinement Fusion operating expenses to provide the balance required for a $2.2 million settlement between DOE and KMS Fusion, Inc.

Energy Supply Research and Development Activities. Reprogramming to provide $1 million for General Plant Projects for support to the Energy Technical Training Center, from operating expense funds within the Environment, Safety, and Health program (Office of Scientific Engineering, Technology and Development).

Energy Supply Research and Development Activities. Reprogramming of $1 million from Nuclear Energy Policy and Management to Nuclear Energy Program Direction to cover salaries, benefits, etc., for current staff.

Energy Supply Research and Development Activities. Reprogramming within the Nuclear Energy Landlord program to provide $141,000 from operating expenses to General Plant Project GPN-103, to modify existing facilities occupied by MK-Ferguson at the Oak Ridge Operations Office Y-12 Plant.

Energy Supply Research and Development Activities. Reprogramming within the Nuclear Energy Landlord program to provide $187,000 from operating expenses to project 94-E-201, Oak Ridge Communications Network, to fund unanticipated shortfall.

Defense Environmental Restoration and Waste Management. Reprogramming of $73,848 from Corrective Activities capital equipment to Waste Management capital equipment to support future well drillings related to the Resource Conservation and Recovery Act, Groundwater Monitoring Installation project at the Richland Operations Office.

Energy Supply Research and Development Activities. Reprogramming of $450,000 within the Environmental Restoration and Waste Management program from Low Level Waste to Waste Operations to provide funds for the Dry Cask Storage Project at the Idaho Operations Office.

Defense Environmental Restoration and Waste Management. Reprogramming of $544,000 from available prior year balances to Corrective Activities construction project 89-D-142, K-Reactor Cooling Tower, to settle a claim by the project's mechanical/electrical subcontractor, Caddell Construction Company.

Weapons Activities. Reprogramming of $500,000 within the Stockpile Support program from canceled project 91-D-122, Short-Range Attack Missile, to project 85-D-113, Pantex Power Plant and Distribution System to complete demolition of the steam plant building.

Energy Supply Research and Development Activities. Reprogramming of $205,000 from available prior year balances to the Technical Information Management Program to cover staffing costs and avoid adverse personnel actions.

Defense Environmental Restoration and Waste Management. Reprogramming of $856,800 within the Waste Management program from General Plant Projects to project 92-D-188, ES&H and Compliance Activities, for the rehabilitation of the K-25 site sanitary sewer collection system in order to minimize violations of the National Pollutant Discharge Elimination System (NPDES) permit.

Energy Supply Research and Development Activities. Reprogramming of $100,000 from capital equipment to operating expenses within the Advanced Radioisotope Power Systems program, to add a 5th shift to the HB Line at the Savannah River Operations Office for processing of plutonium fuel used in the Cassini Radioisotope Thermoelectric Generators (RTGs).

Weapons Activities. Reprogramming of $483,546 in operating expense funds from Program Direction to Research and Development, to fulfill the Department's commitment to fund North Carolina Agriculture and Technology Alliance, which is an activity associated with the Historically Black Colleges and Universities (HBCU).

Energy Supply Research and Development Activities. Reprogramming within the Biological and Environmental Research (BER) program of $349,000 from General Plant Projects to operating expenses to offset the impact of BER's support of the Human Frontier Science Program.

Departmental Administration. Reprogramming of $1 million from Cost of Work for Others program to Personnel Compensation to cover costs associated with the FY 1994 buyout plan.

Materials Support and Other Defense Programs. Reprogramming of $270,000 within the Naval Reactors program from operating expenses to construction project 88-N-103, Material Handling and Storage Modifications, to close out the project.

FISCAL YEAR 1995:

Materials Support and Other Defense Programs. Reprogramming of $680,000 from available prior year balances to Security Evaluations to fund the Under Secretary's request for a review of the Department to obtain information regarding all nuclear-related material and associated information sold or released to the public since 1989.

Energy Supply Research and Development Activities. Reprogramming of $200,000 from available prior year balances to provide funding for Jackson State University.

Energy Supply Research and Development Activities. Reprogramming of $224,000 from operating expenses to capital equipment within the Hydrogen Research program to fund expanded work scope into renewable production methods.

Weapons Activities. Reprogramming within the Stockpile Support program of $340,000 from capital equipment to support liquid stabilization work for construction project 85-D-115, Renovate Plutonium Buildings Utility Systems, at the Rocky Flats Plant.

Energy Supply Research and Development Activities. Reprogramming of $900,000 within the Fusion Energy program from operating expenses to capital equipment for ongoing upgrade of the DIII-D facility to continue the Radioactive Divertor Project on schedule and permit the procurement of the first Gyrotron for the Electron Cyclotron Heating Project.

Defense Environmental Restoration and Waste Management. Reprogramming within the Environmental Restoration and Waste Management program to provide $753,000 from Waste Management operating expenses to Waste Management construction project 92-D-188, New Sanitary Landfill, at the Rocky Flats Field Office, for additional project requirements imposed by the county.

Energy Supply Research and Development Activities. Reprogramming within the Environmental Restoration and Waste Management program to provide $900,000 from Facility Transition operating expenses to the Waste Management program to close out construction project 91-E-322, Building 329 Compliance, at the Richland Operations Office.

INTERNAL REPROGRAMMINGS

Materials Support and Other Defense Programs. Reprogramming of $400,000 of available prior year balances for travel requirements by the Office of Nonproliferation and National Security.

Materials Support and Other Defense Programs. Reprogramming of $600,000 from Security Investigations to Nuclear Safeguards and Security to enable the continued operation of the Nuclear Materials Management and Safeguards System through the end of fiscal year 1995.

Weapons Activities. Reprogramming within the Inertial Confinement Fusion program of $218,000 from capital equipment to operating expenses to support high priority research and development on cryogenic target development work at General Atomics.

Defense Environmental Restoration and Waste Management. Reprogramming of $750,000 within the Waste Management program from General Plant Projects to project 85-D-159, New Waste Transfer Facility, to complete the project.

General Science and Research Activities, and Energy Supply Research and Development Activities. Reprogramming of $9,488 and $130,424 respectively from available prior year balances utilized to support high priority research areas such as confinement systems under Fusion Energy, material sciences under Basic Energy Sciences, and low energy nuclear physics under Nuclear Physics.

Materials Support and Other Defense Programs. Reprogramming of $22,000 within the Arms Control program from operating expenses to capital equipment to purchase computers for the government of Kazakhstan as agreed upon under the Project Sapphire Assistance Package between the U.S. and Kazakhstan governments.

Weapons Activities. Reprogramming of $200,000 within the Marshall Islands program from capital equipment to operating expenses to support a major increase in medical referrals.

Energy Supply Research and Development Activities. Reprogramming within the University and Science Education program of $294,400 from University Programs to Program Direction to support increased costs related to the National Science Bowl and other programs.

Energy Supply Research and Development Activities. Reprogramming of $21,845 within the Hydrogen R&D program from operating expenses to capital equipment to provide funding for the purchase of a Viscometer at the Lawrence Livermore National Laboratory.

Energy Supply Research and Development Activities. Reprogramming of $1 million of available prior year balances to support the Office of Nuclear Energy's Policy and Management program efforts to reduce the threat posed by Russian nuclear reactors. Efforts include a feasibility study for replacement power sources, and conversion of reactor core to one that does not produce plutonium.

Defense Environmental Restoration and Waste Management. Reprogramming of $446,000 within the Facility Transition and Management program from capital equipment to construction project 92-D-187, 300 Area Electrical Distribution Conversion and Safety Improvement, Phase II, at the Richland Operations Offices, to address the consequences of a recent vault fire and to protect vital communication/signal circuits.

Energy Supply Research and Development Activities. Reprogramming of $100,000 of available prior year balances to provide funds to the Biological and Environmental Research program to support the Self Reliance Foundation/Hispanic Radio Network Proposal. This project provides information on energy conservation and efficiency, alternative energy sources, pollution prevention, and other related topics.

Departmental Administration. Reprogramming of $1 million from Cost of Work for Others to Personnel Compensation and Benefits to pay separation costs associated with manpower reductions.

Materials Support and Other Defense Programs. Within the Materials Support program, a reprogramming of $902,983 from construction project 85-D-139, Idaho Fuel Processing Restoration, to project 77-13-A, Fluorinel and Storage Facility, Idaho, to meet final litigation requirements.

FISCAL YEAR 1996:

Weapons Activities. Reprogramming within the Core Stockpile Stewardship program of $1,000,000 from construction project 88-D-105, Special Nuclear Materials Laboratory Replacement, to construction project 95-D-102, Chemistry and Materials Research Facility, at the Los Alamos National Laboratory.

Energy Supply Research and Development Activities. Reprogramming of $711,900 within the Multiprogram Energy Labs - Facility Support program from prior year construction to reduce future year funding requirements.

Defense Environmental Restoration and Waste Management. Reprogramming within the Waste Management program of $530,000 from project 90-D-172, Aging Waste Transfer Lines, to complete the closeout of Project 88-D-173, Hanford Waste Vitrification Plant.

Southwestern Power Administration. Reprogramming of $456,000 of available prior year balances from Operations and Maintenance to Construction ($290,000) and Purchased Power and Wheeling ($166,000). This action funds replacement of switches and environmentally hazardous oil-filled circuit breakers.

Western Area Power Administration. Reprogramming of $960,806 from Purchase Power and Wheeling to Operation and Maintenance for the Boulder Canyon Project.

Other Defense Activities. Reprogramming of $1,000,000 from the Worker and Community Transition program to the Nuclear Safeguards and Security program to initiate implementation of Executive Order 12958 relating to the review of classified National Security Information.

PRIOR YEAR DEOBLIGATIONS

Mr. Myers. Please identify and provide a brief description of all instances in fiscal years 1994, 1995, and 1996 to date when the Controller has authorized use of prior year deobligations for program activities.

Mr. Vivona. Following is a brief description of all instances in fiscal years 1994, 1995, and 1996 to date in which the Controller has authorized use of prior year deobligations for program activities.

FISCAL YEAR 1994:

Energy Supply Research and Development - $59,451 provided to the Office of Nuclear Energy to offset the reduction to FY 1994 budgetary requirements for use of prior year balances in accordance with committee guidelines.

Energy Supply Research and Development - $1,305,880 provided to the Office of Environment, Safety, and Health to offset the reduction to the FY 1994 budgetary requirements for use of prior year balances in accordance with committee guidelines.

Departmental Administration - $130,041 provided for acquisition of hardware and software to support the Chief Financial Officer's imaging initiative.

Energy Supply Research and Development - $866,711 provided for the Small Business Innovative Research Program (SBIR) to comply with the funding levels mandated in the SBIR legislation.

Departmental Administration - $1,763,669 provided to accommodate various programmatic requirements within the account.

Western Area Power Administration - $3,226,392 provided to accommodate the FY 1994 locality pay requirements and to purchase government furnished equipment for the Glen Canyon-Navajo interconnection.

Energy Supply Research and Development - $205,000 provided to the Office of Science Education and Technical Information to cover staffing requirements in the Technical Information Management Program.

Departmental Administration - $84,421 provided for transfer of contract administration related to transportation services.

Departmental Administration - $469,213 provided to finance contract closeout and buyout costs, and increased communication support services.

Energy Supply Research and Development Activities - $1,000,000 provided to support critical isotope production and distribution program activities in accordance with P.L. 103-316, the FY 1995 Energy and Water Development Appropriation Act.

FISCAL YEAR 1995:

Western Area Power Administration Construction, Rehabilitation, O&M - $46,792,011 provided to offset the reduction to FY 1995 budgetary requirements for use of prior year balances in accordance with committee guidelines.

General Science and Research - $257,337 provided to offset the reduction to FY 1995 budgetary requirements for use of prior year balances in accordance with committee guidelines.

Departmental Administration - $755,608 provided to accommodate various programmatic requirements within this account.

Energy Supply Research and Development Activities - $57,970 provided to support the Small Business Innovative Research Program and the Small Business Technology Transfer Program to comply with the funding levels mandated in legislation.

Departmental Administration - $2,326 provided funds to support additional press release and other program requirements in the Office of Public and Consumer Affairs.

Materials Support and Other Defense Programs - $241,166 provided to support additional travel requirements in the Office of Nonproliferation and National Security.

Energy Supply Research and Development Activities - $25,760 provided to fund ongoing Multiple Energy Laboratories - Facilities Support infrastructure planning and facilities management activities.

Departmental Administration Appropriation - $461,758 provided to the Office of Assistant Secretary for Policy, Planning and Program Evaluation primarily to establish a DOE Moscow Office which will coordinate all Departmental activities in Russia and the Newly Independent States.

Departmental Administration Appropriation - $37,823 provided to the Office of Economic Impact and Diversity to offset the reduction to FY 1996 budgetary requirements for use of prior year balances in accordance with committee guidelines.

General Science and Research Activities ($53,989) and Energy Supply Research and Development Activities ($956,594) - funding provided to the Office of Energy Research to offset FY 1995 general and other funding reductions to various program activities.

Energy Supply Research and Development Activities - $1,238,247 provided to Office of Energy Efficiency and Renewable Energy to accommodate FY 1995 reductions to various program activities.

Weapons Activities - $25,000 provided to satisfy significant requirements for existing cooperative research and developmental agreements within the Technology Transfer Program.

Defense Environmental Restoration and Waste Management - $623,054 provided to accommodate reductions to planned FY 1995 program activities and to ensure compliance with mandated cleanup agreements under the Comprehensive Environmental Response, Compensation, and Liability Act.

Energy Supply Research and Development - $1,000,000 provided to support the Office of Nuclear Energys Policy and Management program efforts to reduce the threat posed by Russian nuclear reactors.

Energy Supply Research and Development Activities - $100,000 provided to the Office of Energy Research to support the Deputy Secretary's approved project for the Self Reliance Foundation/Hispanic Radio Network Proposal.

Energy Supply Research and Development Activities - $200,000 provided to meet the Department's commitment to provide funding to the Jackson State University.

FISCAL YEAR 1996:

Other Defense Activities - $377,240 provided to offset the reduction to FY 1996 budgetary requirements for use of prior year balances in accordance with committee guidelines.

Energy Supply Research and Development Activities - $114,508 provided to offset the reduction to FY 1996 budgetary requirements for use of prior year balances in accordance with committee guidelines and to accommodate other program reductions.

Weapons Activities - $1,665,659 provided to offset the reduction to FY 1996 budgetary requirements for use of prior year balances in accordance with committee guidelines.

PRIOR YEAR DEOBLIGATIONS

Energy Supply Research and Development Activities ($300,000) and Weapons Activities Appropriation ($300,000) - funding provided to support joint U.S. and Israel Science and Technology Commission to promote cooperative science and technology activities.

Southwestern Power Administration - Operations and Maintenance - $609,000 provided primarily to purchase replacement circuit breakers in an effort to continue critical ongoing replacement/maintenance program.

Mr. Myers. Please describe the prior year deobligations account.

Mr. Vivona. The recovery of prior year obligations is a management process in which resources resulting from the deobligation or downward adjustment of obligations incurred in prior fiscal years are identified and withdrawn from Departmental elements. These resources are maintained in the specific program, project, or activity in which they were originally appropriated. In this regard, prior year deobligations are not in and of themselves a separate account.

Resources obtained through the prior year deobligation process are held at Headquarters pending submission of formal requests for reuse and related justifications from Departmental elements. If the request is approved by the cognizant Headquarters program organization and the Chief Financial Officer, funds are subsequently made available to the Departmental element for use.

Mr. Myers. What is the basis for this account?

Mr. Vivona. The basis for the current recovery of prior year obligations process is twofold. First, the current process has it historical basis in the "Reform 88 Program" and in response to recommendations from the Grace Commission in the early 1980's. These recommendations called for positive management actions to produce savings and reduce the Department's overall budgetary requirements. In an attempt to meet this objective, beginning on February 1, 1984, the policy and procedures for administering the recovery of prior year obligations were changed to that described in the response to the previous question. Prior to that time, resources resulting from prior year deobligations were tracked in the Department's financial systems; however, they could be automatically utilized by Departmental elements at their discretion without any Headquarters review or oversight.

Further, all of the Department's programs, projects, and activities are financed from no-year appropriations, on a lump sum basis, which remain available until expended. Consequently, resources obtained from the recovery of prior year obligations likewise remain available for obligation for the same purposes for which they were initially appropriated.

Mr. Myers. Why aren't funds returned to Treasury if they are no longer needed for original program activities?

Mr. Vivona. Funds derived through the recovery of prior year obligations are not returned to the Treasury for several reasons. First, most of the Department's programs, projects, and activities are long-term, ongoing activities with program requirements in excess of available funding.

Secondly, prior year deobligations provide a source of funding which is available to satisfy unforeseen or emergency situations/requirements encountered during program execution that could not have been anticipated during the budget formulation process. In the event funds are no longer needed for the original program activity, or other requirements of higher priority emerge, those resources could be realigned to the higher priority activities within the appropriation account utilizing the Department's reprogramming procedures. This helps to minimize any adverse impact or delay to ongoing program activities funded from current appropriations.

Finally, any unused funds at fiscal yearend become a source available to offset future year budgetary requirements.

Mr. Myers. Provide a list of all funds currently being held in this account.

Mr. Vivona. Following is a list of funds, by appropriation account, currently available from the recovery of prior year obligations.

APPROPRIATION ACCOUNT	AMOUNT AVAILABLE (in thousands of dollars)
General Science and Research	6
Energy Supply Research and Development	418
Uranium Supply and Enrichment	1,056
Departmental Administration	352
Office of the Inspector General	128
Weapons Activities	3,658
Defense Environmental Restoration and Waste Management	3,414
Other Defense Activities	1,513
Southeastern Power Administration, Operations and Maintenance	16
Southwestern Power Administration, Operations and Maintenance	151
Alaska Power Administration, Operations and Maintenance	14
Western Area Power Administration, Construction, Rehabilitation, and Operations and Maintenance	2,805

NEW PRODUCTION REACTOR

Mr. Myers. What is the current balance of unobligated and uncosted funds for the New Production Reactor program?

Dr. Reis. The unobligated and uncosted funds for the New Production Reactor program are shown in a table, which I would like to insert in the record. The information follows:

FY 1996 BUDGET EXECUTION
NEW PRODUCTION REACTOR
(IN WHOLE DOLLARS)

AS OF Feb. FIS

	FY 1996 Current Unoblig	FY 1996 Current Uncosted
OPERATING EXPENSES		
Albuquerque		
LOS ALAMOS NATIONAL LABORATORY	0	(1)
SANDIA CORPORATION--LOCKHEED MARTIN	0	5,976
	0	5,975
Chicago		
CHICAGO OPERATIONS OFFICE	0	1,633,837
Idaho		
LOCKHEED IDAHO	0	2,740,072
FLOUR DANIEL INC.	0	5,446
SCIENTECH INC.	0	7,485
	0	2,753,003
Richland		
PACIFIC NORTWEST LAB.	0	0
Oakland		
LAWRENCE LIVERMORE NATIONAL LABORATORY	0	15,000
Savannah River		
SAVANNAH RIVER OPERATIONS OFFICE	0	1,781
	0	1,781
Washington		
HQ & NON INTEGRATED	3,354,850	205,112
TOTAL OPERATING EXPENSES	**3,354,850**	**4,614,708**
CAPITAL EQUIPMENT		
Washington		
HQ & NON INTEGRATED	67,422	0
Chicago		
ARGONNE NATIONAL LABORATORY	0	513
Oak Ridge		
OAK RIDGE NATIONAL LAB.	0	1,281
TOTAL CAPITAL EQUIPMENT	**67,422**	**1,794**
CONSTRUCTION		
Washington		
HQ & NON INTEGRATED	1,474	0
Chicago		
CHICAGO OPERATIONS OFFICE	0	2,013,153
Idaho		
RAYTHEON ENGINEERS	0	2,481
Savannah River		
WESTINGHOUSE SAVANNAH RIVER CO.	0	7,382
TOTAL CONSTRUCTION	**1,474**	**2,023,016**
GRAND TOTAL NPR	**3,423,746**	**6,639,518**

NEW PRODUCTION REACTOR

Mr. Myers. Describe the specific items that comprise the uncosted balances.

Dr. Reis. The above table provides the uncosted balances by contract. These balances represent funds obligated on contracts for completion of approved work scope, contract closeout, overhead rate adjustments, closeout of subcontractors and DCAA audit findings. Examples of work scope to be completed at the Idaho National Engineering Laboratory include disposal of Modular High Temperature Gas-Cooled Reactor (MHTGR) irradiated tritium targets and the cleanup and disposal of mixed and hazardous waste generated during the MHTGR fuel development program at General Atomics and Babcock and Wilcox facilities. At Sandia National Laboratory, efforts are underway to return Mark-22 fuel elements to the Savannah River Site for processing.

Mr. Myers. When will the uncosted balances be liquidated?

Dr. Reis. It is estimated that final closeout, which is constituted by completion of DCAA audits, and liquidation of the uncosted balances could take an additional 4-5 years.

Mr. Myers. The FY 1996 Energy and Water Development Appropriations Act merged operating, capital equipment, and general plant project funding to provide additional flexibility for field managers. It is our understanding that planned FY 1997 implementation actions do not materially improve or change the Department's current process. What other measures does the Department plan to or believe could be implemented to more closely follow the intent of Congress to eliminate Headquarters command and control procedures and provide maximum flexibility for resource allocation in the field?

Mr. Vivona. Upon notification of the Congressional action merging the funding for capital equipment (CE), general plant projects (GPP), and most accelerator improvement projects (AIP) with operating funds in the FY 1996 Appropriations Bill, the Department initiated actions to formulate a plan to achieve the Congressional intent. Because of the short time period between the Congressional action and the beginning of the fiscal year, and to minimize the impact to existing financial systems in FY 1996, it was decided that implementation of this change would be accomplished in two steps. The first step required the development of an interim budgeting and accounting methodology for execution of the FY 1996 budget. The second step required FY 1997 implementation of a permanent approach for this issue.

On October 6, 1995, the first step was implemented through the issuance of the FY 1996 interim implementation guidance to budget and accounting staff at the field and Headquarters. This guidance stated the Department would maintain the capital equipment budget and reporting (B&R) classification codes (prefix 35) and GPP and AIP project identifications (part of B&R prefix 39) as "obligation guidance levels" on the Department's internal Base Table and throughout the financial systems.

The second step will be achieved in FY 1997 through the revision of the Department's financial systems to accommodate a three-digit data field which will identify CE, GPP, and AIP. A "Budget Reference Number" (BRN) data field will be used to capture this data thereby providing a means to identify and report the budget and accounting data within the operating expense control levels designated on the Department's Base Table. The use of the BRN throughout the financial systems will eliminate Congressional Base Table "controls"; eliminate the appearance of internal reprogrammings between operating expenses, CE, etc.; eliminate problems with the reservation of funds; and provide for actual reporting of CE, GPP, and AIP. The approved funding programs (AFPs) will be issued using the appropriate operating expense B&R codes. The use of the BRNs in the AFPs will be optional; however, Headquarters program offices may identify BRNs in the AFPs for CE, GPP, and AIPs to assist in the execution of program requirements.

The proposed implementation plan will achieve an equitable balance between the needs of both the Headquarters and field program managers and should encourage an open line of communication between these two groups. Further, the field organizations will be provided with greater flexibilities in allocating resources for operations and infrastructure activities to fulfill their mission. We believe our actions are consistent with the Congressional intent.

WORKING CAPITAL FUND

Mr. Myers. Provide detail on the proposed "working capital account" or chargeback system being proposed for use with the departmental administration account in Headquarters.

General Durham. In the FY 1997 budget each program element will provide for overhead and administrative activities through the "Program Direction" line of its individual funding request. In this way, funds will be appropriated directly to each program. DOE will obtain a specific appropriation designation from Treasury to identify the Working Capital Fund (WCF) as a distinct financial entity.

During the execution year of the budget, accounting transactions will be recorded at the beginning of the FY to obligate program funds for the estimated amount of goods and services to be consumed. At the same time, payment entries will be made against program funds offset by receipt entries recorded within the WCF In this way, individual programs will pay the Fund in advance of obligations and costs being incurred. Human Resource and Administration (HR) service providers will summarize actual costs incurred by each program during a standard billing cycle (quarterly or monthly, as determined by the WCF Board). HR will generate "bills," or statements of goods and services provided, with associated costs. These periodic statements will serve as authorized source documents for recording actual costs in the official books of account against those obligations and payments already recorded.

The relationship of costs being incurred by each program relative to obligations recorded at the beginning of the FY will be monitored by the WCF Fund Manager. If obligations appear to be in excess of projected annual costs, the Fund Manager will either: deobligate amounts in excess of cost requirements, effectively "returning" funds to affected programs; or issue a "credit" to affected programs toward payment of the next FY's expenses.

If projected costs appear to be in excess of recorded obligations, additional funding is required from affected programs. In this case, the Fund Manager will either seek additional funds from programs, to the extent that doing so would not constitute a reprogramming of funds; or discontinue providing goods and services until the funding shortfall is resolved.

Mr. Myers. Provide a complete description of each item or service being allocated or planned for allocation to program organizations in the working capital fund. Include the funding for that item for fiscal years 1995, 1996 and 1997.

General Durham. The Department is planning to provide nine major business activities or services to program elements through the working capital fund. These services are managed in three areas: administrative services, information management and procurement. Most of these services are provided directly to Headquarters elements; one notable exception is contract audit, where the central procurement organization has funded the interagency agreements for the entire DOE complex.

The administrative services area includes **Building Occupancy** which comprises contract costs for rent, utilities, operation, maintenance and repairs for Headquarters buildings; **Printing and Graphics** which comprises contract costs for photography, graphics, publications design, printing, and court reporting ; **Copying** which comprises contract costs for maintenance and operation of copiers; **Postage** which comprises United States Postal Service charges for mail services, and **Supplies** which comprises consumable office supplies.

The information management area includes **Telephones** which comprises contract costs for commercial, FTS and international telephone services, equipment rental and infrastructure and **AOSS Services** which comprises automated workstations and local area networks contract costs for help desk, hardware components (e.g. memory), software, training, security support, LAN engineering, maintenance and operations.

The procurement area includes **Contract Audit** which comprises contract costs (interagency agreements) for audit and administration of contracts other than M&O contracts and **Contract Closeout** which comprises contract costs to perform tasks to formally close out and retire procurement instruments and make final cost recommendations.

Specific pricing policies for each of these are being developed by the Working Capital Fund Board. The Board may chose to reconfigure these business lines for purposes of pricing accuracy, within the overall scope discussed below. For example, the cost of copy paper may be shifted from the Supply line to the Copying line. Also, telecommunications and local area network infrastructures are closely linked and these business lines may be reconfigured for pricing accuracy.

The funding for the services for fiscal years 1995, 1996 and 1997 are shown in a table which I would like to insert for the record. (The information follows:)

BUSINESS ACTIVITIES AFFECTED BY THE PLANNED WORKING CAPITAL FUND SERVICES

	FY1995 Actuals			FY1996 Estimate			FY1997 Request
Business Line	**HR**	**Programs**	**Total**	**HR**	**Programs**	**Total**	**WCF**
Administrative Services							
Building Occupancy	$49.1	$8.3	$57.3	$48.1	$7.2	$55.3	$55.4
Printing and Graphics	$2.3	$2.0	$4.3	$1.6	$2.0	$3.5	$4.0
Copying	$1.1	$0.2	$1.3	$1.1	$0.5	$1.6	$1.8
Postage	$2.0	$0.2	$2.2	$3.8	$0.9	$4.6	$5.1
Supplies	$2 8	$0.3	$3.1	$2.6	$0.7	$3.3	$3.2
Subtotal	$57.3	$11.0	$68.2	$57.2	$11.3	$68.3	$69.5
Information Management							
Telephones	$4.5	$1.7	$6.1	$6.1	$2.1	$8.2	$8.4
AOSS Services	$2.3	$5.8	$8.1	$0.0	$4.1	$4.1	$5.1
Subtotal	$6.8	$7.5	$14.2	$6.1	$6.2	$12.3	$13.5
Procurement							
Contract Audit	$9.1	$0.0	$9.1	$9.1	$0.0	$9.1	$9.8
Contract Closeout	$0.0	$0.0	$0.0	$0.0	$0.4	$0.4	$0.4
Subtotal	$9.1	$0.0	$9.1	$9.1	$0.4	$9.5	$10.2
Total	**$73.2**	**$18.5**	**$91.5**	**$72.4**	**$17.9**	**$90.1**	**$93.2**

NOTE: For purposes of this table, the term "Programs" refers to two historical methods for chargeout of services: Automated Office Support Services (AOSS) charges to Headquarters elements and "percent population" charges to certain Interior bill programs, notably EIA.

WORKING CAPITAL FUND

Mr. Myers. Under the "provider of choice" concept, how does the Department plan to control those goods/services which may not optimally lend themselves to "choice"? Specifically, the concern is those services which fall into an "economy of scale" category such as copier service agreements where volume agreements are likely more economical than other arrangements. Also, the "provider of choice" concept may put the Department in a position of supporting multiple desktop PC and software platforms rather than some standardized platform configuration which requires less expertise to install and maintenance.

General Durham. Some goods and services must, by regulation, be provided from a centralized Federal source such as the General Services Administration, Government Printing Office, and the U.S. Postal Service. This is the case with building rental , "stock" supplies, printing, and graphics. To that extent, economy of scale is in effect mandated.

In other instances, as with non-stock supplies, photocopiers and automated office equipment, the goal is to become effectively competitive with similar goods and services provided by the private sector and other Federal agencies. The Department expects that open market competition and the ability to seek the most cost efficient provider will help DOE, across all program elements, to realize economies of consumption and pricing that will equal or better current economies of scale.

Technological developments in hardware/software interfaces are becoming more standardized; therefore, limiting the instances of diseconomies based on non-standard multiple platforms. Where necessary, "provider of choice" decisions will be constrained to avoid obvious diseconomies, on an exception basis, only.

Mr. Myers. Normally a WCF is an intra-agency revolving fund in which the assets are capitalized to some asset account. From the preliminary discussions with the Department, we do not believe this is the how the WCF is being proposed. For clarification purposes, please explain the Departments concept of "capitalization" as it relates to the proposed WCF.

General Durham. The Department is not requesting an appropriation to capitalize the Fund. The fixed capital investment for the WCF would be limited to equipment and other assets dedicated to the services provided by the Fund. Accumulated depreciation would be reflected as cash available for replacement equipment, but the accumulated depreciation on the equipment transferred into the account is not being accompanied by the cash required for replacement. In the Department's case, a key Headquarters asset requirement involves corporate information systems improvements, including expansion of electronic infrastructure to accommodate expanded use of automated systems.

The Administration and the Congress recognize the need to maintain a limited cash balance even in internal Federal businesses, and 4 percent of revenues is becoming a standard. For the WCF for FY 1997, this would amount to about $4-5 million.

To obtain such a cash balance, DOE proposes to commence operation of the Fund on a limited test basis by establishing five "pilot" activities in preparation for FY 1997 implementation. The five activities involved in the pilot program are: Supplies, Photocopying, Automated Office Support, Telecommunications, and Contract Audits. However, full implementation of these pilots, including actual assessment of fee-for-service, is contingent upon consultation with and approval by House and Senate Appropriations subcommittees, as well as the Office of Management and Budget.

The Department believes that these pilots merit support both to ensure appropriate implementation and training in WCF concepts leading toward full implementation in FY 1997 and to create a modest cash balance in the Fund. We believe $5 million is a reasonable limit on size of unobligated cash balance to be carried into FY 1997 from FY 1996. We suggest any net new funds be used only for investment purposes including cash balances; new equipment; corporate systems, and WCF implementation requirements (training and procedures).

Mr. Myers. For the record, provide a list of the organizations included on the WCF board. Are the "smaller" headquarters organizations adequately and equitably represented?

General Durham. Members of the WCF Board are expected to represent the whole of the Department rather than their individual program interests. The WCF Board charter is being amended to include ten members. Of those ten, three are permanent organizations: Human Resources and Administration, General Counsel, and Chief Financial Officer. The other seven organizations are appointed on a rotating basis, with one organization funded from the Departmental Administration appropriation, five representatives of other departmental organizations, and one representative of "smaller" headquarters organizations. Currently, Field Management represents the one organization funded from Department Administration, Fissile Materials Disposition represents the smaller headquarters organizations, and the other five are Energy Research, Energy Information Administration, Environmental Management, Defense Programs, and Energy Efficiency and Renewable Energy.

Mr. Myers. Provide a table showing how the costs are estimated to be charged to each program organization.

General Durham. To prepare the FY 1997 budget, my office developed forecasts of the likely working capital fund charges to each customer for each service. The forecasts are shown in a table which I would like to insert for the record. (The information follows:)

Working Capital Fund

Projected Budget by Organization and Function

(dollars in thousands)

	Building Occupant.	Printing and Graphics	Copy-ing	Post-age	Supp-lies	Tele-phones	AOSS Services	Cntrct Audits	Contract Close-out	Total
Departmental Administration										
Office of the Secretary	481	16	49	21	—	108	—	—	—	674
Scheduling and Logistics	116	—	—	—	—	—	—	—	—	116
Secretary of Energy Adv. Board	132	8	2	65	—	—	—	—	—	207
Field Management	928	60	11	9	62	156	80	—	—	1,306
General Counsel	2,016	106	65	27	130	285	19	—	55	2,703
Cong., Intergov't, & Public Affairs	1,256	65	133	196	136	169	—	—	14	1,968
Policy	1,952	110	44	226	111	327	20	—	11	2,801
Human Resources	12,932	748	452	1,304	778	1,546	1,205	392	99	19,456
Quality Management	346	9	13	6	—	—	—	—	—	374
Board of Contract Appeals	—	5	—	—	—	—	—	—	—	5
Worker Training	112	11	6	—	3	9	—	—	—	141
Hearings and Appeals	1,569	35	36	154	27	68	68	—	—	1,957
Chief Financial Officer	1,710	173	55	77	136	406	261	—	—	2,819
Economic Impact and Diversity	427	32	6	24	33	70	—	—	1	593
Total, Departmental Administration	23,977	1,379	871	2,109	1,415	3,144	1,653	392	180	35,119
Other Programs										
Inspector General	1,302	90	11	30	57	210	65	—	3	1,768
Environment, Safety and Health	2,968	277	196	446	244	512	537	29	21	5,230
Energy Efficiency	3,392	203	8	843	127	417	411	284	51	5,737
Nuclear Energy	1,101	93	8	18	70	277	153	480	30	2,231
Civilian Radioactive Waste Mgmt.	1,291	80	11	86	33	135	135	29	1	1,800
Fossil Energy	1,828	110	27	113	84	344	210	1,470	38	4,225
Naval Reactors	—	32	—	—	—	—	—	—	—	32
Energy Information Admin.	6,176	387	44	748	355	558	—	88	12	8,369
Energy Research	1,738	200	25	282	157	410	362	2,352	—	5,526
Science Education & Tech. Info.	310	13	11	36	16	38	27	—	—	450
Research & Development Mgmt.	193	13	—	6	—	5	—	—	—	217
Defense Programs	2,666	287	42	56	211	708	474	1,764	40	6,249
Environmental Management	3,916	432	298	327	233	852	729	2,646	39	9,471
Nuclear Nonproliferation	4,102	305	266	—	195	707	374	88	6	6,043
Fissile Materials Disposition	188	19	11	18	19	16	—	—	—	270
Economic Regulatory Admin.	—	12	—	—	—	—	—	—	—	12
Bonneville Power Administration	130	4	—	3	3	11	—	20	—	171
Western Area Power Admin.	96	4	—	—	5	11	—	225	—	343
Total, Other Programs	31,397	2,562	958	3,012	1,810	5,211	3,477	9,477	241	58,144
Unallocated	—	60	—	—	—	—	—	—	—	60
Total, Department of Energy	55,374	4,000	1,829	5,120	3,225	8,355	5,130	9,869	421	93,323

Mr. Myers. What is the basis for the charge?

General Durham. There were various methods used to forecast the likely working capital fund charges to each customer for each service.

In the administrative services area for **Building Occupancy** costs, the GSA market value estimates were used as the basis for cost estimation and allocation. Estimates were developed of the square footage directly occupied by each office within each building as of October, 1996 (the start of FY 1997) taking into account the planned relocations associated with the Strategic Alignment. The value of this space was calculated based on GSA market estimates, and then the costs for common areas within each building were allocated based on the proportional occupancy of direct space. For **Printing and Graphics**, programs were already historically charged for contracted printing tasks in excess of a cost threshold (currently $500) so the remaining printing jobs were very numerous but small. To estimate each program's share, the percentage of Headquarters population was used, based on Strategic Alignment forecasts for the start of FY 1997. For **Copying**, a sample was taken of metered use of individual in-office copier machines for FY 1995 and was combined with estimates of use of walk-up copiers to derive program-level estimates of overall copier use; for **Postage**, a one-year (FY 1995) sample of metered postage was used to derive annual estimates at the program level; for **Supplies**, a six-month sample of supply room records was used to derive annualized estimates of program level demand for supplies.

In the information management area for **Telephones,** costs for local and domestic long distance calls were allocated among program offices based on the number of phone lines per office and a sample of international calling charges was added. Infrastructure maintenance costs were allocated in accord with the local, domestic long distance, and international calling charges to derive program level allocations of total costs. For **AOSS Services**, FY 1995 charges to programs were used as the basis for estimated future charges.

In the procurement area for **Contract Audits** a thirty-month sample of audit costs was used to derive estimates of future audit costs by procurement office location, and then estimates of the programmatic funding administered at each procurement locations was used to derive estimates of the program responsibility for audit costs. For **Contract Closeout** the costs to close out contracts were allocated among programs based on the estimated uncosted obligation balances for each program using Headquarters Procurement Operations services.

HUMAN RESOURCES AND ADMINISTRATION
EMPLOYEES IN THE OFFICE OF THE SECRETARY

Mr. Myers. By organization, how many employees are assigned to work directly for the Secretary, Under Secretary or Deputy Secretary, but are formally assigned to and paid for by other DOE organizations?

General Durham. The following table depicts by organization, the number of employees whose positions are funded by Departmental program elements and who provide support directly to the Secretary, the Under Secretary, and the Deputy Secretary in accordance with or in addition to their official duties and responsibilities in their official position descriptions. (The information follows:)

EMPLOYEES WHO PROVIDE SUPPORT TO THE OFFICE OF THE SECRETARY, UNDER SECRETARY OR DEPUTY SECRETARY
BY ORGANIZATION

Office of Civilian Radioactive Waste Management	1
Office of Defense Programs	2
Office of Energy Efficiency and Renewable Energy	4
Office of Environment, Safety and Health	1
Office of Energy Information Administration	1
Office of Energy Research	1
Office of Environmental Management	6
Office of Human Resources and Administration	9
Office of Nonproliferation and National Security	1
Office of Policy	1
TOTAL	**27**

Note: This does not include Thomas P. Grumbly, the Acting Under Secretary, nor Dan W. Reicher, the Acting Chief of Staff. Both of these employees are currently funded by organizations other than the Office of the Secretary; however, their permanent appointments to the positions in which they are Acting, are currently pending. Once appointed, they will be funded from the Office of the Secretary.

HUMAN RESOURCES AND ADMINISTRATION
SUPPORT SERVICES

Mr. Myers. Provide a detailed list of activities funded under the support services portion of this budget and funding in fiscal years 1995, 1996 and 1997. Provide the same information for other related expenses.

Mr. Durham. At a detailed level, the budget did not differentiate between support services and other related expenses. The Department is preparing a corporate response to questions similar to this one on support services which will be provided by the end of May. The funding for contractual services for fiscal years 1995, 1996 and 1997 are shown in a table which I would like to insert for the record. (The information follows:)

FUNDING OF SUPPORT SERVICES AND OTHER RELATED EXPENSES

Dollars in Millions

Office/Function	FY1995 Actuals	FY1996 Estimate	FY1997 Request
Assistant Secretary	$0.5	$1.4	$2.2
Administrative Services			
Building Occupancy	$49.1	$48.1	$15.4
Printing and Graphics	$2.3	$1.6	$0.7
Copying	$1.1	$1.1	$0.5
Postage	$2.0	$3.8	$1.4
Supplies	$2.8	$2.6	$0.8
Other Services	$7.1	$6.7	$6.7
Equipment	$0.9	$1.1	$1.1
Subtotal	$65.3	$65.0	$26.6
Information Management			
Telephones	$4.5	$8.1	$3.6
AOSS Services	$2.3	$0.0	$1.2
Other Services	$24.2	$17.9	$20.1
Equipment	$1.5	$1.1	$1.1
Subtotal	$32.5	$27.1	$26.0
Training	$1.3	$0.6	$0.8
Executive Secretariat	$0.3	$0.2	$1.4
Organization & Mgmt	$1.9	$0.4	$0.4
Human Resources	$0.8	$1.0	$1.5
Procurement			
Contract Audit	$9.1	$9.1	$0.4
Contract Closeout	$0.0	$0.0	$0.1
Other Services	$2.3	$1.2	$1.0
Subtotal	$11.4	$10.3	$1.5
Quality Management	$1.7	$1.0	$1.0
SEAB	$0.1	$0.1	$0.1
Representation Fund	$0.0	$0.0	$0.0
Total	**$115.8**	**$107.1**	**$61.5**
Support Services	**$24.9**	**$29.0**	**$29.0**
Other Related Expenses	**$90.9**	**$78.1**	**$32.5**

HUMAN RESOURCES AND ADMINISTRATION
STRATEGIC ALIGNMENT INITIATIVE STAFFING

Mr. Myers. For each Departmental organization at Headquarters and each individual operations, field, site and area office, identify FTEs and end of year employment levels in FY 1995 and projected reductions by year to reach the Strategic Alignment Initiative goal of 27% reduction.

General Durham. The Departmental breakout of FTEs and end of year employment levels for FY 1995 and projected employment reductions through FY 2000 to reach the Strategic Alignment goal of 27% reduction are shown in a table I would like to insert in the record. Please note that due to the addition of the Bureau of Mines with 114 FTEs, the percentage reduction within the SAI universe has changed to 26%. (The information follows:)

Strategic Alignment Initiative Staffing by Site

Organization	City/State	FY 1995 FTE Allocation	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd	FY 1998 Planned EOY OnBrd	FY 1999 Planned EOY OnBrd	FY 2000 Planned EOY OnBrd
Assoc Dep For Field Mgt	Headquarters	99	83	66	66	61	60	58
Chief Financial Officer	Headquarters	280	275	253	253	208	198	192
Civil Rad Waste Mgt	Headquarters	220	124	119	90	71	63	56
Yucca Mountain Site	Las Vegas, NV		104	97	97	97	97	97
Cong / Pub. Intgov't Affairs	Headquarters	131	116	104	98	95	92	90
Defense Programs	Headquarters	335	366	337	284	253	240	230
Econ Impact & Diversity	Headquarters	60	52	50	47	47	46	45
Energy Eff & Renewable Engy	Headquarters	649	455	424	363	343	333	326
Boston Spt Ofc	Boston, MA		15	15	18	17	17	17
New York Spt Ofc	NYC, NY		17	0	0	0	0	0
Philadelphia Spt Ofc	Philadelphia, PA		17	17	18	17	17	17
Atlanta Spt Ofc	Atlanta, GA		24	19	22	21	21	21
Chicago Spt Ofc	Chicago, IL		14	17	18	17	17	17
Kansas City Spt Ofc	Kansas City, MO		14	0	0	0	0	0
Dallas Spt Ofc	Dallas, TX		15	0	0	0	0	0
Denver Spt Ofc	Denver, CO		20	22	22	21	21	21
Seattle Spt Ofc	Seattle, WA		17	24	23	22	22	22
San Francisco Spt Ofc	San Fransisco, CA		18	0	0	0	0	0
Energy Info Admin	Headquarters	486	456	414	368	339	327	320
EIA Dallas Field Ofc	Dallas TX		16	16	16	15	15	15
Energy Research	Headquarters	359	322	325	292	269	260	255
Environmental Mgt	Headquarters	840	749	648	538	527	508	493
Env, Safety & Health	Headquarters	485	422	406	389	339	320	306
EH Site Ofc	Oakland, CA		1	1	2	2	2	2
EH Site Ofc	Rocky Flats, CO		5	3	3	3	3	3
EH Site Ofc	Idaho Falls, ID		4	3	3	3	3	3
EH Site Ofc	Los Alamos, NM		1	2	2	2	2	2
EH Site Ofc	Cincinnati, OH		2	2	2	2	2	2
EH Site Ofc	Aiken, SC		5	4	3	3	3	3
EH Site Ofc	Oak Ridge, TN		6	4	3	3	3	3
EH Site Ofc	Amarillo, TX		2	2	2	2	2	2
EH Site Ofc	Richland, WA		4	4	4	4	4	4
Fissile Materials	Headquarters	20	19	21	20	16	15	14
Fossil Energy	Headquarters	257	201	182	172	161	159	159
Metarie Site Ofc	New Orleans, LA		6	0	0	0	0	0
General Counsel	Headquarters	224	212	200	181	173	158	152
Hearings & Appeals	Headquarters	89	68	67	53	50	45	45
Human Resources & Admin	Headquarters	962	881	765	749	697	673	658

Organization	City/State	FY 1995 FTE Allocation	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd	FY 1998 Planned EOY OnBrd	FY 1999 Planned EOY OnBrd	FY 2000 Planned EOY OnBrd
Inspector General	Headquarters	356	153	194	166	149	139	133
Oak Ridge, Ops Ofc	Oak Ridge, TN		32	31	27	24	23	23
Savannah River, Ops Ofc	Savannah River, SC		15	15	13	12	12	12
Richland Ops Ofc	Richland, WA		13	12	11	10	10	10
Lawrence Livermore	Livermore, CA		13	12	11	10	10	10
Albuquerque Ops Ofc	Albuquerque, NM		27	30	26	23	22	22
Los Alamos Lab	Los Alamos, NM		14	5	5	4	4	4
Nevada Ops Ofc	Las Vegas, NV		6	6	5	4	4	4
Denver	Denver, CO		7	7	6	5	5	5
Idaho Ops Ofc	Idaho Falls, ID		7	7	6	5	5	5
Portland	Portland, OR		2	2	2	2	2	2
Pittsburgh	Pittsburgh, PA		10	9	8	7	7	7
Dallas	Dallas, TX		0	0	0	0	0	0
New Orleans	New Orleans, LA		6	6	5	4	4	4
Princeton	Princeton, NJ		6	6	5	4	4	4
Chicago Ops Ofc	Chicago, IL		6	5	5	4	4	4
Cinncinati	Cinncinati, OH		7	7	6	5	5	5
Nonpro & Nat'l Sec	Headquarters	359	332	349	330	290	282	276
	Geneva, Switzerland		1	1	1	1	1	1
	Vienna, Austria		1	1	1	1	1	1
Nuclear Energy	Headquarters	153	148	140	123	110	106	104
Naval Reactor HQ	Headquarters	60	59	58	58	58	58	57
Ofc of the Secretary	Headquarters	30	22	24	23	22	21	20
Ofc of Quality Mgt	Headquarters	12	11	11	10	10	9	8
Ofc of Policy	Headquarters	225	202	177	169	156	153	151
	Tokyo, Japan		1	1	1	1	1	1
	Paris France		1	1	1	1	1	1
	Moscow, Russia		1	1	1	1	1	1
Research & Dev Mgt	Headquarters	18	18	0	0	0	0	0
Sec of Energy Adv Bd	Headquarters	9	7	6	6	7	6	6
Science Ed & Tech Info	Headquarters	30	27	0	0	0	0	0
Worker Transition	Headquarters	18	16	16	16	15	15	15
Subtotal Headquarters		**6,766**	**6,299**	**5,773**	**5,268**	**4,845**	**4,663**	**4,546**

Strategic Alignment Initiative Staffing by Site

Organization	City/State	FY 1995 FTE Allocation	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd	FY 1998 Planned EOY OnBrd	FY 1999 Planned EOY OnBrd	FY 2000 Planned EOY OnBrd
Operations/Field Ofc								
Albuquerque Ops Ofc	Albuquerque, NM	1,606	951	877	840	858	835	741
Pantex Courier Sec	Amarillo, TX		123	123	120	119	117	115
SE Courier Section	Oak Ridge, TN		98	98	95	94	94	92
Grand Junction Proj Ofc	Grand Junction, CO		22	22	22	22	22	22
Pinellas Area Ofc	Largo, FL		25	28	27	0	0	0
Kirtland Area Ofc	Albuquerque, NM		52	49	47	47	47	46
Kansas City Area Ofc	Kansas City, MO		64	68	65	64	64	63
Amarillo Area Ofc	Amarillo, TX		88	96	95	94	94	92
Los Alamos Area Ofc	Los Alamos, NM		74	82	80	79	79	78
Carlsbad Area Ofc	Carlsbad, NM		58	63	60	59	59	58
Chicago Ops Office	Chicago, IL	596	407	376	368	356	354	345
Argonne West	Idaho Falls, ID		6	6	6	6	6	6
Princeton Area Ofc	Princeton, NJ		17	18	18	17	17	17
Brookhaven	Upton, NY		32	39	38	37	37	36
Fermi	Batavia, IL		14	14	14	14	14	14
Ames Lab	Ames, IA		2	2	2	2	2	2
Envir Measurement Lab	NYC, NY		81	88	86	83	83	81
Idaho Ops Office	Idaho Falls, ID	462	447	421	405	395	393	387
Nevada Ops Office	Las Vegas, NV	410	391	372	343	318	306	293
Oakland Ops Office	Oakland, CA	441	403	371	359	343	340	321
Stanford Site Ofc	Menlo Park, CA		8	8	8	8	8	8
Energy Tech & EC Site	Canoga Park, CA		3	3	3	3	3	3
Berkeley Site Office	Berkeley, CA		14	14	12	11	11	10
Oak Ridge Ops Office	Oak Ridge, TN	772	685	629	590	563	555	521
Cont Electr Beam AFS	Newport News, VA		10	8	8	8	8	8
Portsmouth Site Ofc, OH	Piketon, OH		14	14	14	13	13	12
Paducah Site Ofc	Paducah, KY		10	10	10	10	10	9
Weldon Spring Site Ofc	St Charles, MO		13	12	12	11	11	10
Ohio Field Office	Miamisburg, OH	250	103	104	103	103	103	103
Ashtabula, RMI	Ashtabula, OH		3	4	4	4	4	4
Battelle Columbus	Columbus, OH		2	3	3	3	3	3
Miamisburg Area Ofc	Miamisburg, OH		36	38	38	38	38	38
Fernald Area Ofc	Cincinnati, OH		50	60	60	60	60	60
West Valley Area Ofc	West Valley, NY		24	26	26	26	26	26
Richland Ops Office	Richland, WA	581	564	531	515	500	490	475
Rocky Flats Field Ofc	Rocky Flats, CO	302	301	297	288	287	287	287
Savannah River Ops	Savannah River, SC	623	595	567	513	492	485	468
Centers of Excellence Savings					-57	-57	-57	-57
Subtotal Ops Offices		**6,043**	**5,790**	**5,541**	**5,240**	**5,090**	**5,021**	**4,797**

Organization	City/State	FY 1995 FTE Allocation	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd	FY 1998 Planned EOY OnBrd	FY 1999 Planned EOY OnBrd	FY 2000 Planned EOY OnBrd
Special Purpose Ofc								
OSTI	Oak Ridge, TN	164	140	140	130	122	118	116
Naval Petroleum Res								
Casper Naval Pet Res	Casper, WY	14	13	11	11	0	0	0
Elk Hills Naval Pet Res	Tupman, Calif	43	48	45	45	0	0	0
Golden Field Office	Golden, CO	42	43	46	56	52	52	52
Energy Technology Centers						528	527	527
Morgantown ETC	Morgantown, WV	317	315	279	275			
Pittsburgh ETC	Pittsburgh, PA	309	283	258	283			
Bureau of Mines	Pittsburgh, PA	0	0	371	29	29	29	29
	Albany, OR			85	85	85	85	85
	Spokane, WA			71				
Naval Reactors								
Pittsburgh Nvl Reactor	Pittsburgh, PA	79	79	75	74	73	71	71
Schenectady Nvl Reactor	Schenectady NY	70	65	68	67	66	65	63
Bartlesville Proj Ofc	Bartlesville, OK		26	21	19	18	17	16
Strategic Pet Res	New Orleans, LA	130	119	112	108	107	106	106
Subtotal Spec Purpose		**1,168**	**1,131**	**1,582**	**1,182**	**1,080**	**1,070**	**1,065**
Unallocated		80	0	97	-1	-27	-27	-25
Subtotal		**14,057**	**13,220**	**12,993**	**11,689**	**10,988**	**10,727**	**10,383**
PMAs								
Alaska Power Admin	Juneau, AL	35	28	35	34	0	0	0
Bonneville Power Admin	Portland, OR	3,440	3,274	3,272	3,272	3272	3210	3210
Southeastern Pwr Admin	Elberton, GA	41	37	41	40	40	38	38
Southwestern Pwr Admin	Tulsa, OK	196	193	195	192	188	185	185
Western Area Pwr Admin	Golden, CO	1,467	1,408	1,417	1,387	1387	1387	1387
Subtotal PMAs		**5,179**	**4,940**	**4,960**	**4,925**	**4,887**	**4,820**	**4,820**
Fed Energy Reg Com	Washington, D C	1,463	1,406	1,453	1,463	1,463	1,463	1,463
Total		**20,699**	**19,566**	**19,406**	**18,077**	**17,338**	**17,010**	**16,666**

NOTE The 27% Staffing reduction was computed against an FY 1995 Staffing Allocation of 14,057

HUMAN RESOURCES AND ADMINISTRATION
SUBSIDY FOR ENERGY EMPLOYEES' TRANSIT

Mr. Myers. What were the Department's total costs and costs per employee in fiscal years 1993, 1994, 1995, 1996, and 1997 for the Subsidy for Energy Employees' Transit program?

General Durham The total Departmental costs for the Subsidy for Energy Employees' Transit program in fiscal years 1993, 1994, 1995, 1996, and 1997 are:

FY 1993:	$483,000
FY 1994:	$470,000
FY 1995:	$482,000
FY 1996:	$223,000 (TO DATE)
	$446,000 (FULL YEAR PROJECTED)
FY 1997:	$440,000 (PROJECTED)

The cost per employee has remained at $21.00 per month since the inception of the program in 1992.

Mr. Myers. How many employees participate?

General Durham. The program currently has approximately 1,770 current participants.

FUNDING PROFILE AND FULL TIME EQUIVALENTS

Mr. Myers. What is the cost of the Office of Quality Management and how many FTEs are in this office in fiscal year 1995, 1996 and 1997?

General Durham. The funding profile for the Office of Quality Management is

	(Thousand of Dollars)		
	FY 1995	FY 1996	FY 1997
	$2,234	$1,047	$1,047
FTEs	12	10	10

Mr. Myers. How many employees of other DOE organizations or contractor employees were detailed to this office in each of those years?

Full-Time Equivalents

FISCAL YEAR 1995		FISCAL YEAR 1996		FISCAL YEAR 1997
FEDERAL	CONTRACTOR	FEDERAL	CONTRACTOR	Undetermined
13	15	*2.5	2.3	

*1.0 FTE Detailee from Department of Defense.

Mr Myers Are all costs associated with the Office of Quality Management included in this funding profile or are other activities directed by this office funded in other accounts within the Department? If so, please identify by account and program all funding supporting the activities of this office

Archer Durham No, not all costs associated with the Office of Quality Management were included in the funding profile The following table reflects funding from other accounts within the Department of Energy which was used to support quality training which benefits those organizations This training was performed for purposes of supporting the Department's efforts in reegineering, process improvements, streamlining, leadership development and continuous improvement activities.

FY 95 - Actuals
($000)

DP	EI	EE	ER	EM	EH	FE	NE	NN	NP	Total
95.9	68 0	136.0	102 9	258.7	137.4	59 3	55 8	40.1	5.2	959 3

No Funds have been transferred for FY96 as yet, but requests of approximately the same will be collected for each organization in both fiscal years 1996 and 1997.

HUMAN RESOURCES AND ADMINISTRATION
DEPARTMENTAL ADMINISTRATION STAFFING

Mr. Myers. By organization, how many FTEs are funded in Departmental Administration in fiscal years 1992, 1993, 1994, 1995, 1996 and 1997?

General Durham. Staffing levels requested in the Departmental Administration account are shown in the table which is provided for the record. (The information follows:)

Departmental Administration Full-time Equivalent Congressional Requests

	FY 1992 FTEs Requested	FY 1993 FTEs Requested	FY 1994 FTEs Requested	FY 1995 FTEs Requested	FY 1996 FTEs Requested	FY 1997 FTEs Requested
Office of the Secretary	36	36	30	30	24	24
Sec Energy Advisory Board			0	9	6	6
Congressional & Public Affairs	122	119	124	124	108	99
Chief Financial Officer	261	290	289	278	262	250
Economic Impact & Diversity	22	23	59	56	51	49
Assoc Deputy Field Mgmt			97	92	80	0
General Counsel	160	151	156	162	175	181
Hearings and Appeals	8	8	8	8	6	6
Human Resources	1,038	1,109	968	944	816	742
Policy	166	153	162	196	180	172
Quality Mgmt				12	11	11
Fissile Materials Disposition				0	0	0
Energy Efficiency				6	0	0
Worker Transition				3	0	0
Chicago Ops Ofc	313	313	328	319	296	0
Idaho Ops Ofc	181	184	167	168	153	0
Oakland Ops Ofc	240	240	252	254	233	0
Oak Ridge Ops Ofc	440	410	411	408	388	0
Total	2,987	3,036	3,051	3,069	2,789	1,540

HUMAN RESOURCES AND ADMINISTRATION
FEDERAL AND CONTRACTOR STAFFING LEVELS

Mr. Myers. Provide for the record a table showing fiscal year 1994 and 1995 year-end and fiscal years 1996 and 1997 planned year end personnel strengths for each Headquarters organization and each operations, field, area, support and site offices, and each laboratory and other GOCO activities. The employment levels must be broken out separately for each individual office; i.e., Ohio field office, Fernald area office, RMI project office, etc. Employment levels by site are not to be consolidated by major operations office

General Durham. Federal staffing levels are provided for the end of fiscal years 1994 and 1995, for the first quarter of fiscal year 1996, and estimates for fiscal year 1997. Information for the laboratories and GOCO's is provided for the end of fiscal years 1994 and 1995, and for the first quarter of fiscal year 1996. Staffing estimates for fiscal year 1997 for the laboratories and GOCOs have not been developed. (The information follows:)

04/04/96 Department of Energy Employment by Site

Organization	City/State	FY 1994 EOY Onboard	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd
Assoc Dep For Field Mgt	Headquarters	92	83	66	66
Chief Financial Officer	Headquarters	295	275	253	253
Civil. Rad. Waste Mgt	Headquarters	136	124	119	90
Yucca Mountain Site	Las Vegas, NV	91	104	97	97
Cong., Pub. Ing't Aff.	Headquarters	131	116	104	98
Defense Programs	Headquarters	420	366	337	284
Ec Impact & Diversity	Headquarters	58	52	50	47
Energy Eff & Renewable Eng	Headquarters	447	455	424	363
Boston Spt Ofc	Boston, MA	18	15	15	18
New York Spt Ofc	NYC, NY	15	17	0	0
Philadelphia Spt Ofc	Philadelphia, PA	18	17	17	18
Atlanta Spt Ofc	Atlanta, GA	24	24	19	22
Chicago Spt Ofc	Chicago, IL	15	14	17	18
Kansas City Spt Ofc	Kansas City, MO	18	14	0	0
Dallas Spt Ofc	Dallas, TX	17	15	0	0
Denver Spt Ofc	Denver, CO	22	20	22	22
Seattle Spt Ofc	Seattle, WA	15	17	24	23
San Fransisco Spt Ofc	San Fransisco, CA	17	18	0	0
Energy Info Admin	Headquarters	462	456	414	368
EIA Dallas Field Ofc	Dallas TX	15	16	16	16
Energy Research	Headquarters	365	322	325	292
Environmental Mgt	Headquarters	687	749	648	538
Env, Safety & Health	Headquarters	435	422	406	389
EH Site Ofc	Oakland, CA	1	1	1	2
EH Site Ofc	Rocky Flats, CO	5	5	3	3
EH Site Ofc	Idaho Falls, ID	4	4	3	3
EH Site Ofc	Los Alamos, NM	1	1	2	2
EH Site Ofc	Cincinnati, OH	2	2	2	2
EH Site Ofc	Aiken, SC	5	5	4	3
EH Site Ofc	Oak Ridge, TN	6	6	4	3
EH Site Ofc	Amarillo, TX	2	2	2	2
EH Site Ofc	Richland, WA	4	4	4	4
Fissile Materials	Headquarters	0	19	21	20
Fossil Energy	Headquarters	227	201	182	172
Metarie Site Ofc	New Orleans, LA	6	6	0	0
General Counsel	Headquarters	217	212	200	181
Hearings & Appeals	Headquarters	90	68	67	53
Human Res & Ad	Headquarters	993	881	765	749
Inspector General	Headquarters	178	153	194	166
Oak Ridge, Ops Ofc	Oak Ridge, TN	28	32	31	27
Savannah River, Ops Ofc	Savannah River, SC	20	15	15	13
Richland Ops Ofc	Richland, WA	14	13	12	11
Lawrence Livermore	Livermore, CA	0	13	12	11
Albuquerque Ops Ofc	Albuquerque, NM	29	27	30	26
Los Alamos Lab	Los Alamos, NM	7	14	5	5

04/04/96 Department of Energy Employment by Site

Organization	City/State	FY 1994 EOY Onboard	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd
Nevada Ops Ofc	Las Vegas, NV	7	6	6	5
Denver	Denver, CO	8	7	7	6
Idaho Ops Ofc	Idaho Falls, ID	6	7	7	6
Portland	Portland, OR	6	2	2	2
Pittsburgh	Pittsburgh, PA	9	10	9	8
Dallas	Dallas, TX	3	0	0	0
New Orleans	New Orleans, LA	7	6	6	5
Princeton	Princeton, NJ	8	6	6	5
Chicago Ops Ofc	Chicago, IL	8	6	5	5
Cinncinati	Cinncinati, OH	7	7	7	6
Nonpro & Nat'l Sec	Headquarters	356	332	349	330
	Geneva, Switzerland	1	1	1	1
	Vienna, Austria	1	1	1	1
Nuclear Energy	Headquarters	177	148	140	123
Naval Reactor HQ	Headquarters	59	59	58	58
Ofc of the Secretary	Headquarters	32	22	24	23
Ofc of Quality Mgt	Headquarters	10	11	11	10
Ofc of Policy	Headquarters	231	202	178	170
	Tokyo, Japan	1	1	1	1
	Paris France	1	1	0	0
	Moscow, Russia	1	1	1	1
Research & Dev Mgt	Headquarters	0	18	0	0
Sec of Energy Adv Bd	Headquarters	7	7	6	6
Science Ed & Tech Info.	Headquarters	28	27	0	0
Worker Transition	Headquarters	0	16	16	16
Subtotal Headquarters		**6,626**	**6,299**	**5,773**	**5,268**
Operations/Field Ofc					
Albuquerque Ops Ofc	Albuquerque, NM	996	951	877	840
Pantex Courier Sec	Amarillo, TX	128	123	123	120
SE Courier Section	Oak Ridge, TN	102	98	98	95
Grand Junction Proj Ofc	Grand Junction, CO	16	22	22	22
Pinellas Area Ofc	Largo, FL	29	25	28	27
Kirtland Area Ofc	Albuquerque, NM	39	52	49	47
Kansas City Area Ofc	Kansas City, MO	68	64	68	65
Amarillo Area Ofc	Amarillo, TX	78	88	96	95
Los Alamos Area Ofc	Los Alamos, NM	58	74	82	80
Carlsbad Area Ofc	Carlsbad, NM	48	58	63	60
Chicago Ops Office	Chicago, IL	430	407	376	368
Argonne West	Idaho Falls, ID	6	6	6	6
Princeton Area Ofc	Princeton, NJ	19	17	18	18
Brookhaven	Upton, NY	33	32	39	38
Fermi	Batavia, IL	15	14	14	14
Ames Lab	Ames, IA	3	2	2	2
Envir Meas. Lab	NYC, NY	94	81	88	86

04/04/96 Department of Energy Employment by Site

Organization	City/State	FY 1994 EOY Onboard	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd
Idaho Ops Office	Idaho Falls, ID	487	447	421	405
Nevada Ops Office	Las Vegas, NV	402	391	372	343
Oakland Ops Office	Oakland, CA	393	403	371	359
Stanford Site Ofc	Menlo Park, CA	8	8	8	8
Energy Tech & EC Site	Canoga Park, CA	2	3	3	3
Berkeley Site Office	Berkeley, CA	13	14	14	12
Oak Ridge Ops Office	Oak Ridge, TN	686	685	629	590
Cont Electr Beam AFS	Newport News, VA	10	10	8	8
Portsmouth Site Ofc, OH	Piketon, OH	12	14	14	14
Paducah Site Ofc	Paducah, KY	11	10	10	10
Weldon Spring Site Ofc	St Charles, MO	11	13	12	12
Ohio Field Office	Miamisburg, OH	0	103	104	103
Ashtabula, RMI	Ashtabula, OH	2	3	4	4
Battelle Columbus	Columbus, OH	1	2	3	3
Miamisburg Area Ofc	Miamisburg, OH	30	36	38	38
Fernald Area Ofc	Cincinnati, OH	67	50	60	60
West Valley Area Ofc	West Valley, NY	23	24	26	26
Richland Ops Office	Richland, WA	473	564	531	515
Rocky Flats Field Ofc	Rocky Flats, CO	233	301	297	288
Savannah River Ops	Savannah River, SC	563	595	567	513
	Centers of Excellence				(57)
Subtotal Ops Offices		**5,589**	**5,790**	**5,541**	**5,240**
Special Purpose Ofc					
OSTI	Oak Ridge, TN	164	140	140	130
Naval Petroleum Res					
Casper Naval Pet Res	Casper, WY	14	13	11	11
Elk Hills Naval Pet Res	Tupman, Calif	54	48	45	45
Golden Field Office	Golden, CO	44	43	46	56
Energy Technology					
Morgantown ETC	Morgantown, WV	338	315	279	275
Pittsburgh ETC	Pittsburgh, PA	316	283	258	283
Bureau of Mines	Pittsburgh, PA	0	0	371	29
	Albany, OR			85	85
	Spokane, WA			71	
Naval Reactors					
Pittsburgh Nvl Reactor	Pittsburgh, PA	80	79	75	74
Schnectady Nvl Reactor	Schenectady NY	68	65	68	67
Bartlesville Proj Ofc	Bartlesville, OK	26	26	21	19
Strategic Pet Res	New Orleans, LA	125	119	112	108
Subtotal Spec Purpose		**1,229**	**1,131**	**1,582**	**1,182**

04/04/96 Department of Energy Employment by Site

Organization	City/State	FY 1994 EOY Onboard	FY 1995 EOY Onboard	FY 1996 Planned EOY OnBrd	FY 1997 Planned EOY OnBrd
Unallocated		0	0	97	(1)
Subtotal		**13,444**	**13,220**	**12,993**	**11,689**
PMAs					
Alaska Power Admin	Juneau, AL	32	28	35	34
Bonneville Power Ad-	Portland, OR	3,562	3,274	3,272	3,272
Southeastern Pwr Ad	Elberton, GA	44	37	41	40
Southwestern Pwr Ad	Tulsa, OK	214	193	195	192
Western Area Pwr Ad	Golden, CO	1,502	1,408	1,417	1,387
Subtotal PMAs		5,354	4,940	4,960	4,925
Fed Energy Reg Com	Washington, D.C.	1,415	1,406	1,453	1,463
Total		**20,213**	**19,566**	**19,406**	**18,077**

Note: Centers of Excellence are unallocated SAI savings based on consolidation of Adnministrative functions in the Field.

DOE PRIME CONTRACTOR EMPLOYMENT:
FISCAL YEARS 1988 - 1996

SITE	1988	1989	1990	1991	1992	1993	1994	1995	1996
Richland	11,449	11,683	12,730	14,127	15,107	16,062	17,047	13,197	12,838
Idaho	5,773	6,510	7,548	7,988	7,901	7,810	7,524	6,033	6,033
LLNL	8,007	8,042	8,042	8,158	7,981	8,014	7,321	7,372	7,372
Nevada	8,035	7,996	7,713	7,390	6,670	5,548	5,068	3,940	3,102
SNL	8,372	8,432	8,705	8,804	8,473	8,477	8,458	8,527	8,190
LANL	7,442	7,667	7,402	6,992	7,203	7,293	7,024	6,708	6,511
WIPP	375	506	603	714	775	799	735	640	640
Rocky Flats	5,275	5,312	6,415	7,521	7,302	7,505	6,698	4,418	4,418
Kansas City	6,946	6,829	6,414	5,497	4,489	4,170	3,289	3,563	3,563
Pantex	2,627	2,573	2,390	2,492	2,673	3,020	3,230	3,348	3,348
Mound	2,219	2,150	2,149	2,150	1,741	1,713	1,337	1,163	1,163
Fernald	1,509	1,122	1,128	1,203	1,489	2,296	2,385	2,203	2,108
Savannah River	10,629	16,403	17,663	20,185	20,979	19,788	18,922	16,064	14,914
Oak Ridge	15,651	15,965	15,934	17,200	17,257	17,437	17,215	16,580	16,330
Pinellas	1,710	1,698	1,667	1,618	1,569	1,100	1,007	669	636
SUBTOTAL	**96,019**	**102,888**	**106,503**	**112,039**	**111,609**	**111,032**	**107,260**	**94,425**	**91,168**
Other Sites	31,012	29,277	34,086	33,574	37,077	30,436	28,932	27,500	26,691
GRAND TOTAL	**127,031**	**132,165**	**140,589**	**145,613**	**148,686**	**141,468**	**136,192**	**121,925**	**117,857**

Note. FY 96 figures reflect employment through February 1996.

Mr. Myers. Provide a detailed list of all aircraft chartered by the Department in FY 1994, FY 1995 and FY 1996 to date, and describe the purpose of the charter. Identify by appropriations account, program, and budget and reporting code, where the costs of each of these chartered aircraft were charged. How much funding was included in the Department's budget request in each of the fiscal years for costs of chartered aircraft? By program, how much is included in the FY 1997 budget request for chartered aircraft?

Mr. Vivona. The Department is currently compiling this information and hopes to have a preliminary response ready by May 3, 1996.

HUMAN RESOURCES AND ADMINISTRATION
ADVISORY COMMITTEES

Mr. Myers. Provide a list of advisory committees and the amount budgeted for each in fiscal years 1995, 1996 and 1997.

General Durham. A list of advisory committees and the amount budgeted for each in fiscal years 1995, 1996 and 1997 is shown in a table I would like to insert in the record. (The information follows:)

ADVISORY COMMITTEES
BUDGET INFORMATION

FEDERAL ADVISORY COMMITTEES	ACTUAL EXPENDITURES	PROJECTED COSTS	BUDGET REQUEST
	(Whole Dollars)		
	FY 1995	FY 1996	FY 1997 *
Advisory Committee on External Regulation of Department of Energy Nuclear Safety 1/	1,417,178	627,337	0
Advisory Committee on Human Radiation Experiments 2/	4,504,666	0	0
Advisory Committee on Demonstration and Commercial Application of Renewable Energy and Efficiency Technologies 3/	23,450	244,700	252,041
American Statistical Association Committee on Energy Statistics	51,300	56,700	58,401
Basic Energy Sciences Advisory Committee	358,000	417,000	429,510
Environmental Management Advisory Board	1,043,826	913,796	941,210
Environmental Management Site Specific Advisory Board	2,441,150	3,356,610	3,457,308
Federal Advisory Committee to Develop On-Site Innovative Technologies for Environmental Restoration and Waste Management	813,484	856,079	881,761
Fusion Energy Advisory Committee	32,600	128,600	132,458

ADVISORY COMMITTEES
BUDGET INFORMATION

FEDERAL ADVISORY COMMITTEES	ACTUAL EXPENDITURES	PROJECTED COSTS	BUDGET REQUEST
	(Whole Dollars)		
	FY 1995	FY 1996	FY 1997 *
Health and Environmental Research Advisory Committee	66,600	89,000	91,670
High Energy Physics Advisory Panel	99,600	101,400	104,442
Hydrogen Technical Advisory Panel	97,800	91,200	93,936
Inertial Confinement Fusion Advisory Committee/Defense Programs 4/	58,247	60,425	0
Metal Casting Industrial Advisory Board	68,800	76,000	78,280
National Coal Council	56,000	56,000	57,680
National Electric and Magnetic Fields Advisory Committee	76,126	135,000	139,050
National Petroleum Council	100,000	100,000	103,000
Secretary of Energy Advisory Board	578,481	602,000	620,060
State Energy Advisory Board	164,700	167,000	172,010
Technical Advisory Committee on Verification of Fissile Material and Nuclear Warhead Controls 5/	Inactive	-	-

ADVISORY COMMITTEES
BUDGET INFORMATION

FEDERAL ADVISORY COMMITTEES	ACTUAL EXPENDITURES	PROJECTED COSTS	BUDGET REQUEST
	(Whole Dollars)		
	FY 1995	FY 1996	FY 1997 *
Technical Panel on Magnetic Fusion 6/	Inactive	-	-
TOTAL	9,610,858	4,722,237	4,155,509

* FY 1997 Budget Request column reflects FY 1996 projected costs adjusted upward for inflation for all advisory committees.

1/ Advisory Committee Terminated, December 1995.

2/ Established by Executive Order 12891, January 15, 1994. Terminated, October 1995

3/ Formerly the Advisory Committee on Renewable Energy and Energy Efficiency Joint Ventures.

4/ Committee will terminated in Fiscal Year 1996.

5/ Inactive, pending legislation to terminate the committee.

6/ Inactive, pending legislation to terminate the committee.

HUMAN RESOURCES AND ADMINISTRATION
DOE-SPONSORED CONFERENCES

Mr. Myers. Please provide a list of all conferences sponsored by DOE. Include the number of DOE employees attending, the number of contractor employees, the location and purpose of the conference.

General Durham. The Department does not maintain an official list of all DOE-sponsored conferences; however, we have asked each DOE organization to provide a list of key conferences for fiscal year 1995. A table showing these conferences held during fiscal year 1995 is provided for the record. (The information follows:)

DEPARTMENTAL CONFERENCE ACTIVITIES
FISCAL YEAR 1995

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
"New Visions, Better Decisions" - 25th Anniversary of NEPA	Tyson's Corner, VA	203	191
11th Annual Oak Ridge Model Conference	Oak Ridge, TN	40	798
12th Annual DOE Office of Information Technology Conference	Augusta, GA	35	90
13th PV Program Review	Golden, CO	6	0
13th PV Program Review	Lakewood, CO	6	122
14th North American Meeting of the Catalysis Society	Golden, CO	0	0
14th North American Meeting of the Catalysis Society	Snowbird, UT	0	300
16th Annual US DOE Low-Level Radioactive Waste Management Conference	Phoenix, AZ	23	79
17th DOE Computer Security Group Training Conference	Milwaukee, WI	43	183
17th DOE Computer Security Group Training Conference	Milwaukee, WI	142	251

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
17th Symposium on Biotechnology	Golden, CO	2	0
17th Symposium on Biotechnology	Vail, CO	2	69
18th Annual Trade Conference Trade	Dallas, TX	20	70
18th Solar Photochemistry Research Conference	Tahoe City, CA	3	41
1994 Winter Fuels Conference	Herndon, VA	34	9
1995 Fire Safety Conference	Gatlinburg, TN	32	183
1995 Radiation Protection Workshop	Denver, CO	18	65
1995 Rate Case Field Hearing	Eugene, OR	3	2
1995 Trade Emergency Management Issues Special Interest Group Spring Meeting	Salt Lake City, UT	24	71
1996 Rate Case Hearing	Burley, ID	3	2
1996 Rate Case Hearing	Everett, WA	3	2
1996 Rate Case Hearing	Idaho Falls, ID	3	2
1996 Rate Case Hearing	Kalispell, MT	3	2

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
1996 Rate Case Hearing	Richland, WA	3	2
1996 Rate Case Hearing	Spokane, WA	3	2
19th Actinide Separations	Monterey, CA	5	150
19th Annual Miami Conference on the Caribbean and Latin America	Miami, FL	1	0
1st Annual DOE Information and Communications Technology Workshop	Herndon, VA	6	12
1st NREL Enterprise Growth Forum	Golden, CO	2	0
1st NREL Enterprise Growth Forum	Washington, DC	2	9
2nd Annual Office of Financial Management Conference	Gaithersburg, MD	146	51
2nd Biomass Conference of the Americas	Golden, CO	12	0
2nd Biomass Conference of the Americas	Portland, OR	12	34
2nd TPV Generation of Electricity Conference	Colorado Springs, CO	5	25
2nd TPV Generation of Electricity Conference	Golden, CO	5	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
3-Point Quality Forum	Burlingame, CA	0	25
4th Annual National Gas Conference	Orlando, FL	25	3
4th National Hazardous Waste Offsite Shipment Moratorium Meeting	Atlanta, GA	1	3
5th International Conference on Radioactive Waste Management & Environmental Protection	Berlin, Germany	2	2
5th Role of Point Defects Meeting	Copper Mountain, CO	1	23
5th Role of Point Defects Meeting]	Golden, CO	1	0
6th Annual DOE/Industry/University/Laboratory Forum on Robotics for Environmental Management	Albuquerque, NM	9	95
8-hr Workshop for Self-Assessment Emergency Response Training	Richland, WA	1	14
Ad Hoc EV Battery Readiness Workshop	Golden, CO	3	0
Ad Hoc EV Battery Readiness Workshop	Washington, DC	3	4

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Adaptive Control Systems Technology Symposium	Pittsburgh, PA	20	50
Advanced Reactor Five Year Plan Offsite Meeting	Potomac, MD	27	0
Advanced Reactor Five Year Plan Offsite Meeting	Tyson's Corner, VA	24	0
Advanced Test Reactor User Conference	Idaho Falls, ID	2	5
Advanced Test Reactor User Conference	Idaho Falls, ID	2	5
Advanced Turbine Systems Annual Program Review	Washington, DC	30	12
Advances Approaches to Economical Fusion Power	Monterey, CA	5	85
Agricultural Policy from an Energy Market Meeting	Golden, CO	0	0
Agricultural Policy from an Energy Marketing Meeting	Golden, CO	0	8
Air Emissions Control at Waste Management Facilities	Atlanta, GA	30	10
Air Emissions Control at Waste Management Facilities	Denver, CO	15	15

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Air Emissions Control at Waste Management Facilities	Philadelphia, PA	25	15
Air Emissions Control at Waste Management Facilities	Seattle, WA	20	10
Alternative Energy Technologies Seminar	Lisbon, Portugal	2	1
Ames Structure and Similar Features Conference	Norman, OK	1	0
AMTEX Partnership Progress Report	Washington, DC	10	25
Annual Clean Coal Conference	Denver, CO	60	5
Annual Pollution Prevention Conference XI	Knoxville, TN	68	342
April 1995 Second National Stakeholder Workshop	Denver, CO	48	91
Arctic Oil & Gas Operations	Anchorage, AK	8	2
Arctic Oil/Gas Operations	Anchorage, AK	8	2
ASCI Meeting	Arlington, VA	2	13
ASCI PI Meeting	Arlington, VA	12	54
ASH VII Conference	Arlington, VA	2	4
ASH VII Conference	Golden, CO	2	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Association for Energy Systems, Operations, and Programming	Kansas City, MO	40	60
Backup Power Working Group Semiannual Meeting - April 1995	Augusta, GA	3	34
Backup Power Working Group Semiannual Meeting - October 1995	Albuquerque, NM	5	31
Baseline Environmental Management Report Meetings	Salt Lake City, UT	8	5
Benchmarking Meeting to Discuss LMI Study	Cincinnati, OH	13	16
BIO, SAR Standardization Conference	Dallas, TX	16	58
Biofuels Review Meeting	Golden, CO	1	0
Biofuels Review Meeting	Golden, CO	1	5
Biomass Ecological Research: Defining the Agenda for the North Central States	Golden, CO	2	0
Biomass Ecological Research: Defining the Agenda for the North Central States	LaCrosse, WI	1	2

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Biomass Ecological Research: Defining the Agenda for the North Central States	LaCrosse, WI	2	4
Biomedical Users of AMS	Pleasanton, CA	3	15
BPA/Puget Power NW Washington Transmission Project Supplemental Draft EIS	Bellingham, WA	1	0
BPA/Puget Power NW Washington Transmission Project Supplemental Draft EIS	Sedro Woolley, WA	1	0
Business Management Oversight Pilot Project	Sterling, VA	32	5
Business Plan Supplemental Draft Environmental Impact Statement	Seattle, WA	3	0
Business Plan Supplemental Draft Environmental Impact Statement	Spokane, WA	1	0
Calorimetry Conference	Gaithersburg, MD	0	2
CERCLA Orientation and Remedial Investigation/Feasibility Study	Denver, CO	60	30

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
CH Technology Transfer PIT Team Meeting	Knoxville, TN	13	0
Chief Counsel Meeting	Washington, DC	30	0
Chief Counsel Meeting	Washington, DC	44	0
Clean Cities Conference	Golden, CO	13	0
Clean Cities Conference	St. Louis, MO	13	7
Coal Preparation, Utilization & Environmental Control Contractor Review	Pittsburgh, PA	65	245
Coastal Zone Management Conference	Tampa, FL	2	0
Conference of Beryllium Related Diseases	Triangle Park, NC	5	12
Coordination Meeting for DOE-HQ - December 1994	Denver, CO	3	9
Coordination Meeting for DOE-HQ - January 1995 for DOE-HQ	Denver, CO	3	9
Covington District Maintenance Headquarters Public Meeting	Covington, WA	1	0
Data Quality Objectives for Ecological Assessment	Augusta, GA	7	41

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
DataCleve Client and Ecotrack System	Denver, CO	0	2
Defect and Impurity Engineered Semiconductors and Devices (within the Materials Research Society Spring Meeting)	San Francisco, CA	2	30
Defect and Impurity Engineered Semiconductors and Devises (within the Materials Research Society Spring Meeting(	Golden, CO	2	0
Department Standards Committee (DSC) Meeting (10/18/94)	Washington, DC	50	30
Department Standards Committee Meeting (2/24/95)	Washington, DC	50	30
Department Standards Committee Meeting (4/6-7/95)	Washington, DC	50	30
Department Standards Committee Meeting (5/26/95)	Washington, DC	50	30
Department Standards Committee Meeting (6/23/95)	Augusta, GA	50	30
Department Standards Committee Meeting (8/18/95)	Washington, DC	50	30

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Departmental Standards Committee Meeting (11/17/94)	Washington, DC	50	30
Departmental Standards Committee Meeting (2/8/95)	Washington, DC	50	30
Develop guidance for emergency response training document	Gaithersburg, MD	6	25
Develop learning objectives for safety training in hazardous waste work and emergency response	New Orleans, LA	25	124
Develop Streamlining course content outlines	Pasco, WA	3	15
Direct-Service Industry Contract Meeting	Portland, OR	6	0
Directives Reduction Meeting	Oakland, CA	12	10
DOE & DOE Contractor IH Meeting	Washington, DC	50	150
DOE Compensation Managers Meeting	Denver, CO	3	15
DOE Compensation Managers Meeting	Golden, CO	3	0
DOE Contractor Employee Assistance Program Workshop	Denver, CO	15	85
DOE Contractor Grantee Conference	Santa Fe, NM	8	174

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
DOE Enforcement Program Roles and Responsibilities Workshop	Germantown, MD	30	3
DOE Facilities Order Reduction	Pleasanton, CA	15	10
DOE Industry Threat Conference	Hertford, NC	8	4
DOE Maintenance Managers Meeting	Lombard, IL	17	0
DOE National Lab Budget Officers Workshop	San Francisco, CA	3	0
DOE National Personal Property Management Conference	Albuquerque, NM	76	131
DOE PAAA Coordinators Workshop	Denver, CO	25	2
DOE PAAA Workshop	Germantown, MD	5	43
DOE Property Protection Conference	Sacramento, CA	19	24
DOE Records Management Conference	Albuquerque, NM	74	275
DOE Technical Standards Managers Committee Annual Workshop (10/4-5/94)	Reston, VA	50	50

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
DOE Technical Standards Managers Committee Triennial Meeting (1/31/95-2/1/95)	San Diego, CA	20	20
DOE Technical Standards Managers Triennial Meeting (10/3/94)	Reston, VA	20	20
DOE Technical Standards Managers Triennial Meting (5/6-7/95)	Washington, DC	20	20
DOE Telecommunications Conference	Portland, OR	46	78
DOE Threat Conference	Quantico, VA	23	36
DOE Total Quality Meeting	Breckenridge, CO	10	12
DOE Training Course	Boulder, CO	10	35
DOE Training Courses	San Francisco, CA	0	22
DOE Travel Managers Working Group Meeting	Estes Park, CO	0	27
DOE Travel Managers Working Group Meeting	Golden, CO	0	0
DOE Wind Energy Program Review	Golden, CO	7	0
DOE Wind Energy Program Review	Golden, CO	7	56

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
DOE Winter Fuels Outlook Conference	Washington, DC	37	6
DOE-DOC Working Group Task Team	Washington, DC	1	5
Draft System Operation Review EIS Comment Meeting	Portland, OR	1	1
Draft System Operation Review EIS Comment Meeting	Seattle, WA	1	1
Ecological Data Quality Objectives	Augusta, GA	25	15
EEO Managers Meeting - August 1995	Falls Church, VA	42	0
EEO Managers Meeting - First Quarter	Las Vegas, NV	20	0
EEO Managers Meeting - March 1995	Arlington, VA	30	0
EEO Managers Meeting - Second Meeting	Las Vegas, NV	25	0
EH Resident Quarterly Meeting/Training	Las Vegas, NV	38	2
EH Resident Quarterly Meeting/Training	Mt. Charleston, NV	38	2
EH Resident Quarterly Meeting/Training	Washington, DC	38	2
Electron Molecules, Collisions & Swarm Experiments	Berkeley, CA	0	5

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Electronic Commerce Vendor Training	Reston, VA	4	4
EM Occupational Safety and Health	Augusta, GA	20	3
Employee Concerns Conference	Pasco, WA	9	29
Energy & Environmental Policy Research Workshop	Cambridge, MA	2	0
Energy Efficiency and the Global Environment Conference	Newport, CA	5	15
Energy Emergency Preparedness Conference	Park City, UT	9	4
Energy Research Program Meeting	Rock Hill, SC	28	13
Engineering Foundation Conference on Application of Advanced Technology to Ash-Related Problems in Boilers	Waterville, NH	3	70
Environmental Remediation '95	Denver, CO	310	640
Environmental Safety Meeting	Naperville, IL	53	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Evaluating Potential for Remediating Hazardous Metals & Radio Nuclides in Aquifers & Sub-Surface Conference	Salt Lake, UT	2	18
Evaluating the Potential for Remediating Hazardous Metals and Radio Nuclides In Aquifers and the Sub-Surface Conference	Salt Lake, UT	2	18
Expert System Workshop	Idaho Falls, ID	0	8
Expert System Workshop	Idaho Falls, ID	0	8
Facility Representative Annual Meeting	Las Vegas, NV	124	4
Federal Employee Occupational Safety and Health Program Annual Meeting	San Diego, CA	32	4
Field Managers Meeting	Chicago, IL	7	0
Field Management Town Meeting	Oakland, CA	120	41
Final Granual Flow ARO Review and Planning Meeting	Albuquerque, NM	2	7
Financial Assistance Process Improvement Team Meeting	Lombard, IL	11	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Financial Management Conference	Phoenix, AZ	90	0
First AEAP Science Team Meeting	Pleasanton, CA	0	5
FMSIC/All Contractors Meeting	Pleasanton, CA	20	95
Foreign Affairs Officer's Training	Austin, TX	2	0
Formulate approaches to address new technology issues in Hazardous Waste	Silver Spring, MD	10	10
Forum on NPRM on Disposal of PCBs	Oak Ridge, TN	20	20
Forum on NPRM on Disposal of PCBs	Portland, OR	35	20
Free Jet Specialist Workshop	Estes Park, CO	3	8
Free Jet Specialist Workshop	Golden, CO	3	0
Frontiers in Pyrolysis	Breckenridge, CO	1	17
Frontiers in Pyrolysis	Golden, CO	1	0
Glass Industry Vision of the Future Workshop	Arlington, VA	5	7
Glass Industry Vision of the Future Workshop	Arlington, VA	5	7
GOCO Emergency Preparedness Committee Meeting	Washington, DC	0	12

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
GOCO Operations Committee Steam Team	Atlanta, GA	0	10
Governor's Ethanol Coalition Meeting	Des Moines, IA	0	1
Hard Coating for Plastic Substrates (with the Materials Research Society Spring Meeting)	Golden, CO	2	0
Hard Coatings for Plastic Substrates (within the Materials Research Society Spring Meeting)	San Francisco, CA	2	30
Hazardous Waste Action Coalition - "Eliminating Barriers to Innovative Technology Implementation"	Washington, DC	12	6
HERS Council Financing Residential Energy Efficiency (HERSC-FREE) Conference	Albany, NY	0	2
HEW Transparency Review	Washington, DC	8	12
High Performance Functional Computing	Denver, CO	0	13
High Speed Computing	Glenedden Beach, OR	2	58
Hood River Fisheries Restoration	Hood River, OR	2	1

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Hood River Fisheries Restoration	Warm Springs, OR	2	0
Hybrid Solar Thermal Electric Systems	Golden, CO	4	0
Hybrid Solar Thermal Electric Systems	Golden, CO	4	12
Hydrogen Technical Advisory Panel	Golden, CO	6	0
Hydrogen Technical Advisory Panel	Golden, CO	6	20
Hydrogen Technical Advisory Panel	Golden, CO	6	0
Hydrogen Technical Advisory Panel Meeting	Alexandria, VA	6	30
ICO Discussion Workshop	Pleasanton, CA	0	55
Identify learning objectives for six courses in Streamlining	Richland, WA	4	14
IEA Multiphase Flow Science Committee Meeting	Albuquerque, NM	3	1
IH Analytical Chemistry Lab Directors' Meeting	San Diego, CA	1	17
Implement and evaluate draft HAZWOPER training guidelines in HAZWOPER Handbook*	Richland, WA	4	6

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Implementation of Recommendation 90-2	St. Louis, MO	41	36
In-House Energy Management/Utilities Management Conference	San Francisco, CA	50	100
Indian Association for Radiation Protection (IARP) International Conference on "Internal Radiation Dosimetry	Bombay, India	1	0
Information and Opportunities Workshop - April 1995	Prairie View, TX	12	0
Information and Opportunities Workshop - October 1994	Arlington, VA	12	0
Interlab '94	Golden, CO	5	32
Interlab '94	Golden, CO	5	0
Interlab '95	Golden, CO	6	0
Interlab'95	Copper Mountain, CO	6	36
International Coalbed Methane Conference	Katowice, Poland	3	3
International Conference on Coal Science	Oviedo, Spain	9	16
International Conference on High-Level Radioactive Waste Management	Las Vegas, NV	97	300

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
International Conference on Microbial Enhanced Oil Recovery & Related Biotechnology for Solving Environmental Problems	Dallas, TX	1	5
International Conference on Strategic Value of Fossil Fuels - Challenges & Responses	Houston, TX	5	0
International Energy Conference for Energy & Economic Development	Boulder, CO	1	0
International Incineration Conference	Bellevue, WI	12	50
International Pavilion at the American Association of Petroleum Geologists Annual Meeting	Houston, TX	4	2
International Petroleum Environmental Conference	New Orleans, LA	1	1
International Seminar for Ion Atom Collision	Seattle, WA	40	20
International Sherwood Theory	Incline Village, NV	0	76

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
International Seminar for Ion Atom Collision	Seattle, WA	40	20
International Sherwood Theory	Incline Village, NV	0	76
International Symposium & Trade Fair on Cleanup of Manufactured Gas Plants	Prague, Czech	2	3
International Symposium on Heavy Ion Inertial Fusion	Princeton, NJ	3	71
International Technical conference on Coal Utilization & Fuel Systems	Clearwater, FL	11	4
Iran Roundtable	Washington, DC	60	3
IRP Class	Columbia, SC	1	0
IRP Customer Meeting	Greer, SC	1	0
IRP Meeting	Athens, GA	1	0
IRP Meeting	Atlanta, GA	1	0
IRP Meeting	Atlanta, GA	1	0
IRP Meeting	Atlanta, GA	1	0
IRP Meeting	Atlanta, GA	2	0
IRP Meeting	Cookeville, TN	1	0
IRP Meeting	Cookeville, TN	2	0
IRP Meeting	Durham, NC	1	0
IRP Meeting	Jackson, MS	1	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
IRP Meeting	Knoxville, TN	1	0
IRP Meeting	Pickens, SC	1	0
IRP Meeting	Washington, DC	1	0
IRP Workshop	Atlanta, GA	2	0
Korea Electric Power Seminar Mission	Seoul, Korea	7	1
Landfill Stabilization Focus Area Team	Gaithersburg, MD	5	15
Lessons Learned Meeting for FY97 Budget Development Process	Gaithersburg, MD	149	52
Lessons Learned Process Improvement Team Meeting - December 1994	New Orleans, LA	13	19
Lessons Learned Process Improvement Team Meeting - June 1995	Denver, CO	15	24
Lessons Learned Process Improvement Team Meeting - March 1995	Albuquerque, NM	18	28
Lessons Learned Process Improvement Team Meeting September 1995	Idaho Falls, ID	12	15
Liquefaction Contractor Review	Pittsburgh, PA	37	132

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Low Emission Boiler System Program Workshop	Atlanta, GA	10	8
Magnetic Resonance and the Environment	Richland, WA	5	30
Management of PCBs	Knoxville, TN	30	20
Management of PCBs	Knoxville, TN	9	70
Management Planning Session	Maryville, TN	8	0
Management Planning Session	Stanley, VA	10	0
Management Practices Workshop	Denver, CO	62	15
Managing Hazardous Air Pollutants & Particulate Emissions Symposium	Toronto, Canada	4	5
Managing Human Health and Ecological Risk Assessments under CERCLA and RCRA	Berkeley, CA	35	20
Managing Human Health and Ecological Risk Assessments under CERCLA and RCRA	Washington, DC	20	0
Materials in Inventory Kickoff	Augusta, GA	70	14
Materials Management Workshop	Pleasanton, CA	0	35

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Materials Research Society Spring Meeting	Pittsburgh, PA	2	30
Meeting of NEPA Compliance Officers - Implementation of the Secretarial NEPA Policy Statement	Washington, DC	126	48
Melatonin Summit Conference	Troutdale, OR	1	4
Metal Casting Visions of the Future Workshop	Beachwood, OH	3	4
Metal Casting Visions of the Future Workshop	Beachwood, OH	3	4
Microbial Activity at Yucca Mountain	Lafayette, CA	0	18
Microbially Enhanced Oil Recovery Workshop	Grayville, IL	1	1
MIR Technology Exhibit	Pleasanton, CA	0	20
National Compliance Agreements Roundtable	Washington, DC	48	32
National Crisis Communications Conference	Salt Lake City, UT	19	76
National Moratorium Workshop	Atlanta, GA	15	65

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
National Stakeholder's Conference on the DOE's Formerly Utilized Sites Remedial Action Program	Washington, DC	24	1
Natural Gas RD&D Contractor Review	Baton Rouge, LA	25	75
Natural Phenomena Hazards Design and Evaluation Workshop	Arlington, VA	0	55
Naval Reactors Information Exchange	Schenectady, NY	1	5
Naval Reactors Information Exchange	West Mifflin, PA	1	5
Nevada Test Site Classification Public Meeting	Las Vegas, NV	27	23
NIF Optics Workshop	Pleasanton, CA	10	25
Northeast Resource Recovery Association Conference & Exposition	Golden, CO	0	0
Northeast Resource Recovery Association Conference & Exposition	Nashus, NH	0	0
November 1994 First National Stakeholder Workshop	Herndon, VA	52	58
Nuclear Facility Management Group	Atlanta, GA	0	33

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Nuclear Facility Safety Committee	Rockville, MD	0	12
Numerical Tokamak Symposium	Incline Village, NV	0	30
Occurrence Reporting Process Improvement Team Meeting - March 1995	Las Vegas, NV	25	18
Office of Integrated Analysis and Forecasting National Energy Modeling System - Annual Energy Outlook 1995	Arlington, VA	75	25
Oil and Gas Energy and Law Conference	Moscow, Russia	19	1
Oil Recovery Technology Project Review	Dallas, TX	5	43
OSHA Coordinating Committee/Revise DOE 5483.1A	Denver, CO	22	3
OSHA Coordinating Committee/Revise DOE 5483.1A	San Antonio, TX	25	5
Pacific Northwest National Laboratory/Tri-Cities Industrial Development Council Economic Development and Technology Commercialization Workshop	Kennewick, WA	0	15

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Pacific Northwest National Laboratory/Tri-Cities Industrial Development Council Technology Fair	Pasco, WA	0	15
Partnerships in Trade	Kennewick, WA	0	4
Patents Field Chiefs Meeting	Arlington, VA	59	19
PEIS Public Meeting	Willowbrook, IL	2	0
Pellet Fuel Workshop	Arlington, VA	1	5
Permanent Magnet Synchrotron Conference	Berkeley, CA	0	21
Photovoltaics Radiometric Workshop	Golden, CO	0	0
Photovoltaics Radiometric Workshop	Vail, CO	0	16
PI/Quality Management Spring Meeting - May 1995	Baltimore, MD	20	70
Planning Retreat to Measure 1994 Program Performance and Update Strategic Plan	Solomons, MD	10	1
Plutonium Stabilization and Immobilization Workshop	Washington, DC	41	66

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Plutonium Vulnerability Assessment Team Training	Colorado Spring, CO	40	108
Prehearing Conference/Initial Proposal for 1996 Rate Case	Portland, OR	2	0
Proceedings of the 17th Annual Seismic Research Symposium on Monitoring a Comprehensive Test Ban Treaty, 12-15 September 1995	Scottsdale, AZ	1	41
Process Water and Energy Efficiency for the NW Food Industry	Kennewick, WA	2	0
Product Specification Meeting	Richland, WA	8	30
Professional Secretary Conference	Pasco, WA	500	4
Protecting Our Stratospheric Ozone Shield - The DOE Facility Phaseout of Ozone-Depleting Substances	Arlington, VA	40	76
Public Affairs Field Director's Meeting	San Antonio, TX	20	0
Public Affairs Meeting 7/18/95	Long Island, NY	30	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Public Utilities In-House Energy Management	San Francisco, CA	0	145
PV Performance & Reliability Workshop	Golden, CO	1	0
PV Performance & Reliability Workshop	Lakewood, CO	1	55
PV Standards & Codes	Golden, CO	0	0
PV Standards & Codes	Golden, CO	0	16
Pyrochemical Workshop	Bodega Bay, CA	2	23
Quark Matter '95	Monterey, CA	4	95
Radiological Assistance Program Outreach Meeting	Augusta, GA	13	38
Rate Case Field Hearing	Pasco, WA	3	2
Rate Case Field Hearing	Seattle, WA	5	2
Rate Case Field Hearing	Spokane, WA	4	2
Rate Case Field Hearing	Springfield, OR	3	2
Rate Case Field Hearings	Boise, ID	3	2
Rate Case Field Hearings	Kalispell, MT	3	2
RCRA Orientation and Definition of Solid and Hazardous Wastes	Germantown, MD	11	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
RCRA Orientation and Definition of Solid and Hazardous Wastes	Idaho Falls, ID	25	10
Regional Assessment Seminar	Park City, UT	9	4
Release Reporting and EPCRA	Knoxville, TN	20	66
Release Reporting and EPCRA	San Diego, CA	5	2
Release Reporting and EPCRA	Washington, DC	30	0
Resource Contingency Plan Draft EIS Pubic Comment Briefings	Elma, WA	1	0
Resource Contingency Plan Draft EIS Public Comment Briefings	Chehalis, WA	1	1
Resource Contingency Plan Draft EIS Public Comment Briefings	Hermiston, OR	1	0
Roles & Responsibilities Discussion	Fairfield, OH	15	1
Roles & Responsibilities Discussion	Middletown, OH	15	1
Russia Integrated Resource Management Workshop	Moscow, Russia	1	4
Safeguard and Security Director' Conference	Clearwater, FL	55	35

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Safety Culture Revolution	San Francisco, CA	6	0
SECP All States Conference	Biloxi, MS	25	20
SECP All States Conference	Golden, CO	25	0
Security Evaluations Training Sessions	Washington, DC	25	3
Seeds of Greatness: Cultivating Personal Excellence	Pasco, WA	12	575
Seismic Hazards Characterization	Palo Alto, CA	0	10
September 1995 Third National Stakeholder Workshop	Albuquerque, NM	37	68
Sharing Conference/Process Improvement	Pasco, WA	400	6
Sixteenth Annual U.S. Department of Energy Low-Level Radioactive Waste Management Conference	Phoenix, AZ	23	79
Skyline Farms Pilot Project	Ontario, Canada	3	2
Small Business Conference	Sharonville, OH	25	60
Small Business Diversity Conference	Pasco, WA	1	5

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
SO2 Control Symposium	Miami, FL	6	10
Society of Petroleum Engineers/DOE Colloquium on Petroleum Engineering Education	Snowmass, CO	1	0
Soltech 95	Golden, CO	20	0
Soltech 95	San Antonio, TX	20	35
South Fort Snake River Wildlife Management Plan Environmental Assessment	Ririe, ID	1	0
South Fort Snake River Wildlife Management Plan Environmental Assessment	Swan Valley, ID	2	0
Southeast Power Administration Alliance	Atlanta, GA	4	0
Southeast Power Administration Alliance	Mobile, AL	5	0
SSRA Program	Pleasanton, CA	0	15
Stakeholder Meetings for Fossil Energy's International Implementation Plans	New Orleans, LA	25	40
Stakeholder Meetings for Fossil Energy's International Implementation Plans	Pittsburgh, PA	25	40

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Stakeholder Meetings for Fossil Energy's International Implementation Plans	Pittsburgh, PA	25	40
Stakeholder Meetings for Fossil Energy's International Implementation Plans	San Francisco, CA	30	12
State Heating Oil and Propane Meeting	Madison, WI	3	1
Strategic Alignment and Contract Reform	Washington, DC	15	0
Subcommittee on Consequence Assessment and Protective Actions Semiannual Meeting	Charleston, SC	5	25
Summit	Atlanta, GA	5	0
SWAG Meeting	Gaithersburg, MD	4	12
Team Building and Process Reengineering	Washington, DC	23	2
Team Cumberland	Chattanooga, TN	6	0
Technical Personnel Coordinating Committee	Augusta, GA	20	3
Technology Transfer Workshop	Portland, OR	0	0

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Thirty-third Hanford Symposium on Health and the Environment "In-Situ Remediation: Science Basis for Current and Future Technologies	Pasco, WA	2	74
Transportable Vitrification System	Johnson City, TN	1	10
Transportation Coordination Group	Baltimore, MD	7	8
Tri-Oxide Superconductors Workshop	Breckenridge, CO	0	10
Tri-Oxide Superconductors Workshop	Golden, CO	0	0
Tri-Valley Expanding Your Horizons	San Ramon, CA	0	240
Twelfth Office Information Technology Conference	Augusta, GA	0	3
U.S. -Russia Gazprom Conference	Saratov, Russia	4	0
Unburned Carbonaceous Materials on Utility Fly Ash Meeting	Pittsburgh, PA	20	10
UNITAR International Conference on Heavy Crude and Tar Sands	Houston, TX	10	10

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
University Coal Research Contractor Review	Nashville, TN	30	160
University Coal Research Review	Pittsburgh, PA	25	8
US/African Energy Partnerships & technical Workshop for African Development Funding	Santa Fe, NM	4	0
US/EE/FSU Electric Power Conference, April 2-5, 1995	Bucharest, Romania	6	2
USA/FSU Workshop (Actinides in the Environment)	Pleasanton, CA	10	30
USITER Magnetic Task Group Meeting	Pleasanton, CA	0	25
Validate learning objectives for Streamlining courses	Richland, WA	4	10
Village Power Workshop	Golden, CO	9	0
Village Power Workshop	Washington, DC	9	15
Waste Management '95	Tucson, AZ	44	73
Water Hammer Lessons Learned Workshop	Pasco, WA	15	95

TITLE/PURPOSE	LOCATION	DOE ATTENDANCE	DOE CONTRACTORS
Western Regional Biomass Energy Program (WRBEP) and Agricultural Resource Group Program Review Meeting	Nebraska City, NE	10	5
Westinghouse GOCO Operations Committee Meeting	Denver, CO	0	5
Westinghouse GOCO Steering Team	Albuquerque, NM	1	4
Wetlands Mitigation Banking Workshop	Crystal City, VA	4	6
Windpower 95	Golden, CO	10	0
Windpower 95	Washington, DC	10	25
Yakima Fisheries Project Revised Draft Environmental Impact Statement Open House Public Meeting	Cle Elum, WA	1	0
Yakima Fisheries Project Revised Draft Environmental Impact Statement Open House Public Meeting	Yakima, WA	2	0

HUMAN RESOURCES AND ADMINISTRATION
SCHEDULE C EMPLOYEES

Mr. Myers. Please provide the number of Schedule "C" employees by organization and compare this number with fiscal year 1994 and 1995.

General Durham. The attached table contains the number of Schedule C employees by organization for Fiscal Year 1996 to date as compared to Fiscal Years 1994 and 1995. (The information follows:)

TABLE OF DOE SCHEDULE C (Sch C) EMPLOYEES
BY ORGANIZATION

ORGANIZATIONS	FY94	FY95	FY96
	Sch C	Sch C	Sch C
Office of the Secretary	9	5	5
Secretary Energy Advisory Board	0	0	0
Bonneville Power Administration	0	0	0
* Congressional and Intergovernmental Affairs	6	4	---
Congressional, Public & Intergovernmental Affairs	---	---	9
Chief Financial Officer	1	1	2
Economic Impact & Diversity	0	2	2
Defense Programs	1	0	.0
Energy Efficiency and Renewable Energy	9	11	11
Environmental, Safety & Health	1	1	1
Energy Information Administration	1	1	1
Environmental Management	10	11	11
Executive Secretariat	4	0	0
Energy Research	2	2	3
Science Education & Technical Information	1	1	1
Fossil Energy	2	3	3
Field Management (Headquarter & Field Offices)	1	2	2
General Counsel	4	3	3
Human Resources and Administration	6	6	5
Nuclear Energy, Science and Technology	1	3	3
Nonproliferaton and National Security	2	2	3
Policy, Planning and Program Evaluation	5	9	10
* Public and Consumer Affairs	2	4	*
Quality Management	0	0	0
Research Management	0	0	0
Scheduling and Logistics (Merged w/HR FY 95)	6	*	*
Southeastern Power Administration	0	0	0
Civilian Radioactive Waste Management	2	1	1
Worker and Community Transition	0	1	1

* Congressional, Public & Intergovernmental Affairs and Public & Consumer Affairs merged to form Congressional & Intergovernmental Affairs 12/95 As of 2/17/96

HUMAN RESOURCES AND ADMINISTRATION
CARMA INTERNATIONAL CONTRACT

Mr. Myers. The CARMA contract in support of the public affairs office was originally charged to a budget and reporting account in the Human Resources budget for computer and telecommunications services. The contract does not appear to fit within this accounting category. Please explain why this contract was not charged to the public affairs account. Please describe any other public affairs expenses charged to Human Resource funds in FY 1994, FY 1995 and FY 1996 to date.

General Durham. Human Resources and Administration provides support for small staff offices funded within Departmental Administration. This support includes printing and graphics, AOSS, information systems, contracting support and the like. Funds for these services are included within HR's budgeting and reporting structure as it would not be efficient to maintain resource management capabilities for each small office within the Departmental Administration account. For fiscal years 1994, 1995, and 1996 to date, Human Resources has provided funds for such routine administrative support in the categories mentioned earlier to the Office of Public Affairs.

The Office of Public Affairs had a requirement to monitor and collect data from national and regional news reports with a capability to extract and query by subject of articles. Development of a unique computer software package was considered and a requirement study was completed. The results of this study were that such a unique, internally managed system would not only be costly in the development phase, but also for the personnel costs required to operate long-term. The Computer Aided Research and Media Analysis (CARMA) International had the computer technology to provide the required data. The Office of Public Affairs requested Human Resources to provide contracting support for the CARMA requirement from the Information Management budget. The contract was cancelled in August 1995.

HUMAN RESOURCES AND ADMINISTRATION
TRAINING

Mr. Myers. Provide detail on funding of fiscal years 1995, 1996 and 1997 training activities by (1) field element and (2) DOE headquarters. The response should include: (1) the cost of training organizations, the cost associated with contracting for training (i.e., course instructors, training materials, facility and equipment rental, etc.) and the value of the time for federal/contractor personnel being trained (that is, the value of salary/fringes/other costs for the time involved in the training) The response should identify dollars for the following categories:

(a) support for technical qualifications (93-3) - federal personnel.

(b) support for DOE Order 5480.20a - contractor personnel.

(c) professional development - federal personnel Note: Intended to capture the balance of all federal training (exclusive of (a) above)

(d) professional development - contractor personnel. Note: Intended to capture the balance of all contractor-related training (exclusive of (b) above).

(e) Provide comparative data for fiscal years 1995 and 1996.

General Durham. We have contacted all Departmental elements to provide this information. Upon receipt, we will compile the information received and provide it to the Committee by May 15, 1996.

HUMAN RESOURCES AND ADMINISTRATION
BUYOUT COSTS

Mr. Myers. What was the average cost by headquarters and field organization for each employee who took the buyout in fiscal years 1995 and 1996?

General Durham. In FY 1995, 268 Headquarters and 459 Field employees took buyouts. Thus far in 1996, 145 Headquarters and 168 Field employees have taken buyouts.

The average cost of a buyout includes the average cost of the buyout (maximum $25,000), the average cost of payment for annual leave at the time of separation, and the average cost of the 9% surcharge required to the Civil Service Retirement System for buyouts given to employees taking an early retirement. In FY 1995, the average cost of a Headquarters buyout was $37,232 and the average cost of a field buyout was $32,619 Thus far in FY 1996, the average cost of a buyout in the Headquarters has been $40,280 and the average cost of a buyout in the field has been $35,420.

CONTRACT AWARDS

Mr Myers. Provide for fiscal years 1994, 1995, and 1996 the detail on Departmental contract awards to 8a and small and disadvantaged businesses to include both DOE prime contracts as well as those awarded by the M&O contractors. Show in summary form by field element.

Mr Durham. In response to this question, we will provide a complete spreadsheet of this information under separate cover.

HUMAN RESOURCES AND ADMINISTRATION
CONTRACT AWARDS

Mr. Myers. As a part of the total procurement awards, what percent is represented by this category in each fiscal year.

General Durham. In FY 1995, 8(a) awards represented 2.7% of the total procurement funding, while awards to other small disadvantaged businesses represented 3.3% of the total procurement funding.

In FY 1994, 8(a) awards represented 2.0% of the total procurement funding, while awards to other small disadvantaged businesses represented 2.8% of the total procurement funding.

Fiscal year 1996 information is not yet available.

Mr. Myers. What can the Department provide to indicate the efficiency of these type of awards and what specific steps are being taken in the contract negotiations/contract instruments to ensure that appropriate performance measures are incorporated?

General Durham. In February, 1994, the Report of the Contract Reform Team recommended that the Department move away from traditional approaches to contracting for services to approaches that rely on performance based contracting principles. Utilizing the guidance provided by the Office of Federal Procurement Policy Letter 91-2 Service Contracting, the Department has issued guidance to our contracting activities in Acquisition Letter 95-4, which provides to contracting officers contracting concepts and methods to fulfill the objectives of maximizing the use of performance based contracting.

Contracting officers are being encouraged to utilize these methods and concepts. At present, little information is available on the results of the use of such contracting methods; however, the Department is establishing a Past Performance Data Base which will provide information concerning the performance of contractors under such contracts.

Mr. Myers. What process does the Department have in place to make evaluations relative to the expectations for performance-based contracts in this arena and the ensuing performance results?

General Durham. Individual contracting officers will annually evaluate the performance of the performance based service contractors. They will report the results of this evaluation to the Department's Past Performance Data Base. This data base will be accessible to contracting officers throughout the Department for their use in making future award decisions.

FIELD MANAGEMENT
SUPPORT SERVICE CONTRACT INFORMATION FOR M&O CONTRACTORS

Mr. Myers. Please identify any support service contracts which have been awarded by M&O Contractors.

Mr. Pearman. The Department is currently collecting contract information on Support Service from all M&O Contractors. We expect to be able to provide this information to you by the end of May.

FIELD MANAGEMENT
SUPPORT SERVICE CONTRACT INFORMATION FOR M&O CONTRACTORS

Mr. Myers. Has your office (M&O) awarded any support service contracts at the request of a Headquarters program organization? If so, identify each HQ program organization, describe the contract, identify the contractor receiving the award, and provide contract cost.

Mr. Pearman. The Department is currently collecting Support Service contract information from all M&O Contractors. We expect to be able to provide this information to you by the end of May.

ECONOMIC DEVELOPMENT ACTIVITIES

Mr. Myers. Provide a description of all economic development activities funded by your office on fiscal years 1995, 1996 and proposed for 1997. Include cost of the activity, the participants, the purpose, and the source of funds.

Mr DeGrasse. We have the tasked individual sites to provide descriptions concerning their individual practices. We will provide the description requested as soon as it is available

Required Legislation

Mr. Myers. Please describe all proposals contained in the fiscal year 1997 budget which will require legislation to implement and identify the congressional committee with jurisdiction over the issue. Indicate whether the request for legislation has been formally submitted to the appropriate authorizing committee.

Mr. Nordhaus. Legislative proposals needed to support the fiscal year 1997 budget request would:

- reauthorize the Department of Energy program to remediate mill tailings at inactive uranium sites and nearby properties under the Uranium Mill Tailings Radiation Control Act (H.R. 2967 as reported by the House Commerce Committee would reauthorize the program and modify it slightly; in the Senate, S. 341 has been referred to the Energy and Natural Resources Committee);

- clarify existing authority to allow foreign governments to store their oil in unused storage capacity at the Strategic Petroleum Reserve (submitted to the House on May 4, 1995, as part of the Administration's extension and modification of Strategic Petroleum Reserve and International Energy Agency authorities under the Energy Policy and Conservation Act, but not introduced -- the Commerce Committee has ordered reported a related bill, H.R. 2596; introduced in the Senate as part of the Administration's larger bill, S. 1605, and referred to the Energy and Natural Resources Committee);

- require the Secretary of Energy to sell 72 million barrels of oil from Weeks Island Strategic Petroleum Reserve facility in FY 2002 (not yet submitted);

- refinance the Bonneville Power Administration's outstanding Federal repayment obligation (introduced as H.R. 799 in the House and referred to the Resources Committee; passed by the Senate as part of its version of H.R. 3019, the Omnibus Consolidated Rescissions and Appropriations Act, Fiscal Year 1996, and now in conference);

- amend the law requiring the Secretary of Energy to sell the Naval Petroleum Reserve Numbered 1 to provide for its sale during FY 2002 (not yet submitted);

- clarify existing authority for private power plants on Government installations to sell excess electrical power off-site (submitted to Congress February 24, 1995, not introduced); and

- authorize a fee on foreign customers of Government uranium enrichment services similar to the fee paid by domestic purchasers (not yet submitted).

Although the question of appropriate Committee jurisdiction is strictly an internal congressional matter under House and Senate Rules, based on the Department's understanding of these Rules it seems likely that the unintroduced or unsubmitted proposals on foreign fee for uranium enrichment, sale of electric power off Federal sites, and sale of Weeks Island oil would be referred to the Commerce Committee in the House and the Energy and Natural Resources Committee in the Senate. The Naval Petroleum Reserve sale proposal would go to the National Security Committee in the House and the Armed Services Committee in the Senate.

LITIGATION

Mr Myers Are there any lawsuits currently outstanding at DOE facilities which may be settled in the next two years and (1) which could require DOE funds for substantial settlements and/or (2) could involve substantial costs to comply with court-mandated materials/etc (i.e , The Cook Case)

Mr Nordhaus The Department supports early resolution of litigation through settlement negotiations or other forms of alternative dispute solution The outstanding lawsuits that present the most substantial exposure to the Department are mass tort actions brought against former or current contractors at DOE's Rocky Flats, Hanford, Mound and Portsmouth facilities Under the terms of DOE's (or its predecessor agencies') contracts with the defendants in these cases, as well as under the terms of the Price-Anderson Act, the Department generally would be required to pay the costs of any settlements or judgments in these lawsuits

Mr Myers. Please provide a summary listing of litigation costs incurred by each DOE contractor in fiscal years 1994, 1995, 1996 and estimated in 1997

Mr Nordhaus. The Office of General Counsel tracks cost information on cases involving DOE contractors in which litigation expenses have been approved for reimbursement. A breakdown of the approved litigation costs for each DOE contractor has been compiled from this information for fiscal years 1994, 1995 and the first quarter of 1996 Since the Department currently only requires contractors to submit estimated budgets for cases in which costs are likely to exceed $100,000, estimates of total contractor litigation costs for fiscal year 1997 are unavailable. The following table, which I would like to insert for the record, shows the FY 1994, 1995 and 1996 costs:

CONTRACTOR LITIGATION COSTS
(Table Follows)

Contractor Litigation Costs

Contractor	Fiscal Year 1994	Fiscal Year 1995	Fiscal Year 1996
DuPont	$116,000.00	$600,833.00	$136,021.00
EG&G	$595,973.00	$1,187,990.00	$364,805.00
FERMCO	$973,502.00	$511,467.00	$231.00
General Electric	$1,212,260.00	$719,369.00	$8,719.00
Goodyear	$176,155.00	$17,957.00	$413.00
KEH	$1,031.00	$15,254.00	$17,996.00
LMES	$0.00	$3,273.00	$16,320.00
Mason Hanger	$23,685.00	$214,915.00	$471,542.00
MK-Ferguson	$18,164.00	$56,680.00	$7,612.00
MMSC	$0.00	$101,582.00	$5,894.00
US(Prescott)	$1,144,959.00	$22,273.00	$0.00
NLO	$1,992,670.00	$2,034,716.00	$39,531.00
PNL	$424,052.00	$1,767,686.00	$129,938.00
Rockwell	$2,361,522.00	$3,605,558.00	$617,928.00
University of California	$1,430,929.00	$1,225,086.00	$275,086.00
Union Carbide	$1,567,000.00	$405,493.00	$0.00
UNC	$585,000.00	$394,292.00	$80,018.00
URA	$72,895.00	$577,227.00	$443,731.00
Wackenhut	$50,000.00	$210,411.00	$75,353.00
WEC	$24,250.00	$66,952.00	$16,505.00
WEMCO	$187,812.00	$111,571.00	$16,084.00

Contractor Litigation Costs

Contractor	Fiscal Year 1994	Fiscal Year 1995	Fiscal Year 1996
BMI	$19,462.00	$36,962.00	$9,008.00
Princeton	$132,801.00	$203,281.00	$55,098.00
Am Pro	$7,526.00	$0.00	$0.00
Brookhaven- AUI	$395,274.00	$946,763.00	$8,210.00
Argonne	$197,796.00	$227,446.00	$52,499.00
Fermilab	$28,380.00	$110,307.00	$40,134.00
Sandia	$525,711.00	$755,547.00	$96,009.00
NREL	$6,015.00	$6,688.00	$5,520.00
REECO	$99,167.00	$162,231.00	$94,502.00
RSN	$100,292.00	$218,996.00	$0.00
Inland Orange	$0.00	$3,690.00	$43.00
MMES	$4,370,805.00	$2,053,394.00	$363,575.00
ORAU	$2,898.00	$186,365.00	$89,079.00
WVNS	$20,431.00	$117,991.00	$26,007.00
Allied Signal	$0.00	$8,846.00	$1,362.00
Aetna	$7,652.00	$7,541.00	$0.00
ARHCO	$307,000.00	$1,122,921.00	$0.00
British Petroleum	$255,243.00	$68,347.00	$1,309.00
Chevron	$6,818.00	$7,634.00	$8,281.00
DM	$0.00	$9,570.00	$12,975.00
Dow	$1,116,701.00	$1,373,518.00	$435,099.00

Contractor Litigation Costs

Contractor	Fiscal Year 1994	Fiscal Year 1995	Fiscal Year 1996
WHC	$458,527.00	$718,623.00	$614,186.00
WSI	$363,805.00	$397,258.00	$115,107.00
WSRC	$578,369.00	$179,799.00	$85,930.00

CONTRACTOR COST REIMBURSEMENT

Mr. Meyers. How is it possible that a DOE contractor can install the wrong parts at a government facility and DOE is required to pay for the wrong part when clearly it was contractor error? The specific incident being referred to occurred at the Savannah River Site in November.

Mr. Nordhaus. We believe that the incident you are referring to involved corrective work that Bechtel Savannah River, Inc. (BSRI), Westinghouse Savannah River Company's (WSRC) subcontractor, was required to perform after a subcontractor employee inadvertently ground down and put incorrect flanges on some pipes, which deviated from the wall thickness requirements. The costs of correcting the pipe thickness and replacing the flanges were allowable costs under this prime and subcontract. The WSRC contract and the BSRI subcontract are a cost reimbursement prime contract and cost reimbursement subcontract. These kinds of contracts are generally used when the nature of the work to be performed is not clearly definable in advance, or is subject to risks or uncertainties, which make it impracticable to utilize a fixed price contract. Under these contracts at Savannah River, the contractors were generally reimbursed for all work, including correction of errors made in good faith, unless there was willful misconduct or lack of good faith on the part of top contractor management. No such willful misconduct or lack of good faith was found to exist in this situation. Thus, the costs were considered allowable.

ECONOMIC IMPACT AND DIVERSITY

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Mr. Myers. List by DOE organization and field element the total funding provided for Historically Black Colleges and Universities in fiscal years 1994, 1995, and estimated for 1996.

Mrs. Moody. Total Departmental funding to Historically Black Colleges and Universities was $53 million in fiscal year 1994 and $59 million in fiscal year 1995. The Department has set a goal of $75 million for fiscal year 1996. Funding provided by field elements are included with the Departmental organization reports.

(DOLLARS IN THOUSANDS)

PROGRAM	FY 94 ACTUALS	FY 95 ACTUALS	FY 96 ESTIMATE
Defense Programs	$10,162	$6,593	$9,191
Economic Impact and Diversity	1,225	653	313
Energy Efficiency and Renewable Energy	2,830	3,971	4,694
Environment, Safety, and Health	87	110	550
Energy Information Administration	27	116	175
Environmental Management	21,167	30,582	18,701
Energy Research	11,881	11,702	35,544
Fossil Energy	3,445	3,381	2,378
Science Education	1,207	0	0
Human Resources	636	0	0
Nuclear Energy	347	1,618	928
Nonproliferation and National Security	0	25	1,435
Policy	106	120	66
Civilian Radioactive Waste Management	144	389	1,262
TOTAL:	$53,264	$59,260	$75,237

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

HISPANIC SERVING INSTITUTIONS

Mr. Myers. Provide the same information for Historically Spanish Institutions

Mrs. Moody. The information you have requested for fiscal year 1994 is not available. In response to Executive Order 12900, which was signed by the President on February 22, 1994, the Department is currently developing a comprehensive data base that will enable us to provide you with the fiscal year 1994 information you reqested for these institutions by May 1, 1996. The table below delineates the funding provided to such institutions during fiscal 1995 and estimated funding for fiscal year 1996.

DOE Organization	FY 1995	FY 1996 (estimated)
Defense Programs	$2,400,000	$2,451,000
Economic Impact	540,000	20,000
Renewable Energy	564,000	1,252,000
Environmental Health	0	147,000
Energy Information	0	47,000
Environmental Mngt.	1,965,280	4,987,000
Energy Research	2,453,765	9,478,000
Fossil Energy	83,000	634,000
Nuclear Energy	0	247,000
Non-proliferation	0	383,000
Policy	0	18,000
Radioactive Waste	0	336,000
Science Education	2,138,600	0 (Office eliminated)
Totals	$10,144,645	$20,000,000

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Mr. Myers. Please provide a list of each Historically Black College and University and Historically Spanish Institution that received DOE funding, categorize the type of expenditures such as research, equipment, or facility renovation, and provide the amount of funds each received for these activities in fiscal years 1994, 1995, 1996, and estimated for 1997.

Mrs. Moody. The Departmental funding to Historically Black Colleges and Universities by institution and category of expenditure is attached for fiscal years 1994 and 1995. The information for fiscal year 1996 and 1997 will not be available until the end of the respective fiscal years.

The Department has set a goal of $20 million in support of Hispanic Serving Institutions in fiscal year 1996. Data are not available by institutions or category or expenditure for fiscal years 1994, 1995, and 1996. We will provide data for these years by November 15, 1996. The data for fiscal year 1997 will be provided by November 15, 1997.

TABLE III
FY 1994
UNITED STATES DEPARTMENT OF ENERGY AWARDS TO INSTITUTIONS

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
ALABAMA												
ALABAMA A&M				8,287		11,500		85,000			299,388	404,175
ALABAMA STATE												0
BISHOP STATE COMM.												0
CARVER CAMPUS												0
CONCORDIA COLLEGE												0
FREDD STATE TECH												0
LAWSON STATE						98,040						98,040
MILES COLLEGE												0
OAKWOOD COLLEGE												0
SELMA UNIVERSITY												0
J.F. DRAKE TECH												0
STILLMAN COLLEGE				8,566								8,566
TALLADEGA COLLEGE												0
TRENHOLM STATE TECH												0
TUSKEGEE UNIVERSITY	136,260				416,514			34,000				586,774
ARKANSAS												
ARKANSAS BAPTIST												0
PHILANDER SMITH												0
SHORTER COLLEGE												0
U. OF ARKANSAS @ PB	19,000		19,097									38,097
DELAWARE												
DELAWARE STATE				51,750								51,750
DISTRICT OF COLUMBIA												
HOWARD UNIVERSITY	2,169,000		153,600		501,802	15,500	1,000				85,503	2,926,405
UNIV. OF D. C.			24,333								30,000	54,333

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
FLORIDA												
BETHUNE COOKMAN	9,000		24,334									33,334
EDWARD WATERS												0
FLORIDA A&M	4,550,351				436,000	21,000	37,000	95,000			324,388	5,463,739
FLORIDA MEMORIAL												0
GEORGIA												
ALBANY STATE				16,419								16,419
CLARK ATLANTA U.	1,003,448		5,500,000	4,000		4,000	3,000		208,000		122,210	6,844,658
FORT VALLEY STATE			225,000			390,000	18,000				200,000	833,000
INTERDENOMATIONAL THEOLOGICAL CENTER												
MOREHOUSE COLLEGE	15,000		38,504			21,500						75,004
MOREHOUSE MEDICAL												0
MORRIS BROWN				6,512		94,612						101,124
PAINE COLLEGE	51,000				547,999	112,000						710,999
SAVANNAH STATE	140,000		174,000			10,168						324,168
SPELMAN COLLEGE						10,000		34,000				44,000
KENTUCKY												
KENTUCKY STATE												0
LOUISIANA												
DILLARD UNIVERSITY	20,000		19,710									39,710
GRAMBLING STATE												0
SOUTHERN U. & A&M								154,000			36,468	190,468
SOUTHERN/BATON ROUGE	463,000				403,584			105,000	240,000		62,500	1,274,084
SOUTHERN/NEW ORLEANS					6,240							6,240
SOUTHERN/SHREVEPORT												0
XAVIER UNIVERSITY	1,505,866	1,200,000	3,114,630		39,678	23,000					31,250	5,914,424
MARYLAND												
BOWIE STATE					7,350	1,000						8,350
COPPIN STATE												0
MORGAN STATE	50,000				400,225	1,000		34,000				485,225
U. OF MARYLAND ES	198,698				10,127							208,825

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
MICHIGAN												
LEWIS COLLEGE OF BUS.												0
MISSISSIPPI												
ALCORN STATE						42,000						42,000
COAHOMA JR. COLLEGE												0
HINDS COMM. COLLEGE												0
JACKSON STATE	918,000		28,143	44,000	12,800	64,534						1,067,477
MARY HOLMES												0
MISSISSIPPI VALLEY	9,000											9,000
RUST COLLEGE	199,948								36,206			236,154
TOUGALOO COLLEGE												0
MISSOURI												
HARRIS STOWE STATE												0
LINCOLN UNIVERSITY												0
NORTH CAROLINA												
BARBER-SCOTIA												0
BENNETT COLLEGE			20,653									20,653
ELIZABETH CITY STATE	9,000											9,000
FAYETTEVILLE STATE	15,000											15,000
JOHNSON C. SMITH												0
LIVINGSTONE COLLEGE												0
N. C. A&T STATE	459,350	2,000	7,200	262,070	573,112	361,634	6,000	722,000			321,951	2,715,317
N. C. CENTRAL						20,000		10,000				30,000
ST. AUGUSTINE												0
SHAW UNIVERSITY												0
WINSTON-SALEM STATE											28,762	28,762
OHIO												
CENTRAL STATE	466,000										50,000	516,000
WILBERFORCE UNIV.												0
OKLAHOMA												
LANGSTON UNIV.			24,333			24,153		23,000				71,486

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
PENNSYLVANIA												
CHEYNEY UNIV.				75,000								75,000
LINCOLN UNIV.			14,400		46,800	30,308	4,000				28,435	123,943
SOUTH CAROLINA												
ALLEN UNIVERSITY												0
BENEDICT COLLEGE						200,000						200,000
CLAFLIN COLLEGE					1,208,929	56,000						1,264,929
CLINTON JR. COLLEGE												0
DENMARK TECH.												0
MORRIS COLLEGE												0
S. C. STATE UNIV.	372,000		126,570		69,400	12,000	2,000				4,696	586,666
VOORHEES COLLEGE												0
TENNESSEE												
FISK UNIV.	100,000										50,000	150,000
KNOXVILLE COLLEGE												0
MORRISTOWN CAMPUS												0
LANE COLLEGE			19,220									19,220
LEMOYNE-OWEN												0
MEHARRY MEDICAL												0
TENNESSEE STATE	399,948				411,450	8,261	1,000					820,659
TEXAS												
HUSTON-TILLOTSON												0
JARVIS CHRISTIAN			24,334								83,000	107,334
PAUL QUINN COLLEGE						39,328						39,328
PRAIRIE VIEW A&M	970,272		344,785		413,828			84,000	30,000		9,000	1,851,885
SAINT PHILLIP'S												0
SOUTHWESTERN CHRIST.												0
TEXAS COLLEGE												0
TEXAS SOUTHERN			7,000		225,000						50,000	282,000
WILEY COLLEGE												0

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
VIRGINIA												
HAMPTON UNIV.	855,000		115,000		409,200	1,000		235,000			293,102	1,908,302
NORFOLK STATE	110,000				2,283,851			50,000				2,443,851
SAINT PAUL'S												0
VIRGINIA STATE	150,000		3,600		16,323	5,000	1,000				2,363	178,286
VIRGINIA UNION					7,250							7,250
WEST VIRGINIA												
BLUEFIELD STATE	9,000											9,000
W. VIRGINIA STATE												0
U.S. VIRGIN ISLANDS												
UNIV. OF THE V. I.												0
VARIOUS	114,000		205,000			410,000		3,553,000		200,000	6,525,420	11,007,420
GRAND TOTAL	15,487,141	1,202,000	10,233,446	476,604	8,447,462	2,087,538	73,000	5,218,000	514,206	200,000	8,638,436	52,577,833

CATEGORIES

R&D - RESEARCH & DEVELOPMENT
PE - PROGRAM EVALUATION
TRAINING
F&E - FELLOWSHIP, RECRUITMENT, IPA
SFA - STUDENT FINANCIAL ASSISTANCE
DIS - DIRECT INSTITUTIONAL SUBSIDIES
TPA - THIRD PARTY AWARDEES
PSI - PRIVATE SECTOR INVOLVEMENT
AI - ADMINISTRATIVE INFRASTRUCTURE
VARIOUS - PROJECTS SUPPORTING MULTIPLE HBCUS FOR WHICH EXACT DOLLAR AMOUNTS FOR SPECIFIC SCHOOLS CANNOT BE ASSIGNED

TABLE III
FY 1995
FEDERAL AGENCY AWARDS TO INSTITUTIONS

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SPA	DIS	TPA	PSI	AI	*OTHER	TOTALS
ALABAMA												
ALABAMA A&M	100,000	0	0	8,287	0	36,000	0	189,729	0	0	14,731	348,747
ALABAMA STATE	0	0	0	0	0	0	0	0	0	0	0	0
BISHOP STATE COMM	0	0	0	0	0	0	0	0	0	0	0	0
CARVER CAMPUS	0	0	0	0	0	0	0	0	0	0	0	0
CONCORDIA COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
FREDD STATE TECH	0	0	0	0	0	0	0	0	0	0	0	0
LAWSON STATE	0	0	0	0	0	0	0	0	0	0	0	0
MILES COLLEGE	0	0	0	0	0	86,000	0	0	0	0	0	86,000
OAKWOOD COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
SELMA UNIVERSITY	0	0	0	0	0	0	0	0	0	0	0	0
J F DRAKE TECH	0	0	0	0	0	0	0	0	0	0	0	0
STILLMAN COLLEGE	0	0	0	8,566	0	0	0	0	0	0	0	8,566
TALLADEGA COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
TRENHOLM STATE TECH	0	0	0	0	0	0	0	0	0	0	0	0
TUSKEGEE UNIVERSITY	753,958	0	7,000	0	30,000	48,000	0	234,618	0	0	0	1,073,576
ARKANSAS												
ARKANSAS BAPTIST	0	0	0	0	0	0	0	0	0	0	0	0
PHILANDER SMITH	0	0	0	0	0	0	0	0	0	0	0	0
SHORTER COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
U OF ARKANSAS @ PB	0	0	0	0	0	0	0	142,563	0	0	0	142,563
DELAWARE												
DELAWARE STATE	0	0	38,000	155,418	0	0	0	0	0	0	0	193,418
DISTRICT OF COLUMBIA												
HOWARD UNIVERSITY	1,407,132	0	39,068	0	0	47,500	0	383,222	0	0	126,343	2,003,265
UNIV OF D C	0	0	0	0	0	0	0	0	0	0	88,000	88,000

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
FLORIDA												
BETHUNE COOKMAN	10,000	0	0	0	0	0	0	0	0	0	0	10,000
EDWARD WATERS	0	0	0	0	0	0	0	0	0	0	0	0
FLORIDA A&M	1,127,774	0	7,000	0	30,000	94,500	0	155,556	0	80,000	0	1,494,830
FLORIDA MEMORIAL	0	0	0	0	0	0	0	0	0	0	0	0
GEORGIA												
ALBANY STATE	0	0	0	103,691	0	0	0	0	0	0	0	103,691
CLARK ATLANTA U	1,372,108	110,000	7,052,000	0	30,000	0	0	28,167	0	0	116,000	8,708,275
FORT VALLEY STATE	230,000	0	100,000	0	1,150,000	713,414	0	69,500	0	0	200,000	2,462,914
INTERDENOMATIONAL	0	0	0	0	0	0	0	0	0	0	0	0
THEOLOGICAL CENTER	0	0	0	0	0	0	0	0	0	0	0	0
MOREHOUSE COLLEGE	0	0	0	0	0	21,500	0	100,000	0	0	0	121,500
MOREHOUSE MEDICAL	0	0	0	0	0	0	0	0	0	0	0	0
MORRIS BROWN	0	0	0	6,512	0	58,500	0	67,563	0	0	0	132,575
PAINE COLLEGE	104,283	0	39,488	0	0	0	0	0	0	0	0	143,771
SAVANNAH STATE	10,000	0	0	0	29,200	179,000	0	0	0	0	0	218,200
SPELMAN COLLEGE	0	0	62,132	0	5,000	10,000	0	94,667	0	0	0	171,799
KENTUCKY												
KENTUCKY STATE	0	0	0	0	0	0	0	0	0	0	79,000	79,000
LOUISIANA												
DILLARD UNIVERSITY	0	0	0	0	0	0	0	67,563	0	0	0	67,563
GRAMBLING STATE	0	0	0	0	25,000	0	0	67,563	0	0	0	92,563
SOUTHERN U & A&M	600,000	0	0	2,500,000	0	0	0	267,556	0	0	11,000	3,378,556
SOUTHERN/BATON ROUGE	186,246	63,000	0	45,000	44,873	0	0	67,563	0	0	0	406,682
SOUTHERN/NEW ORLEANS	0	0	0	0	0	0	0	67,563	0	0	0	67,563
SOUTHERN/SHREVEPORT	0	0	0	0	0	0	0	0	0	0	0	0
XAVIER UNIVERSITY	1,007,600	4,233,113	837,440	6,500,000	30,000	46,500	0	0	0	0	0	12,654,653
MARYLAND												
BOWIE STATE	0	0	0	0	0	0	0	0	0	0	75,000	75,000
COPPIN STATE	0	0	0	0	0	0	0	0	0	0	0	0
MORGAN STATE	850,000	0	0	0	50,000	16,000	0	172,222	0	0	0	1,088,222
U OF MARYLAND ES	0	0	0	0	0	0	0	0	0	0	13,000	13,000

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
MICHIGAN												
LEWIS COLLEGE OF BUS	0	0	0	0	0	0	0	0	0	0	0	0
MISSISSIPPI												
ALCORN STATE	0	0	0	0	0	58,500	0	0	0	0	0	58,500
COAHOMA JR COLLEGE	0	0	0	36,896	0	0	0	0	0	0	0	36,896
HINDS COMM COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
JACKSON STATE	1,033,000	0	0	72,392	25,000	58,500	0	0	0	0	0	1,188,892
MARY HOLMES	0	0	0	0	0	0	0	0	0	0	0	0
MISSISSIPPI VALLEY	54,000	0	0	38,205	6,201	0	0	0	0	0	0	98,406
RUST COLLEGE	0	0	37,435	0	0	0	0	67,563	0	0	0	104,998
TOUGALOO COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
MISSOURI												
HARRIS STOWE STATE	0	0	0	0	0	0	0	0	0	0	0	0
LINCOLN UNIVERSITY	0	0	0	0	0	0	0	0	0	0	0	0
NORTH CAROLINA												
BARBER-SCOTIA	0	0	0	0	0	0	0	0	0	0	0	0
BENNETT COLLEGE	0	0	39,900	0	0	16,000	0	0	0	0	0	55,900
ELIZABETH CITY STATE	10,000	0	0	0	50,000	0	0	0	0	0	0	60,000
FAYETTEVILLE STATE	0	0	0	0	0	0	0	0	0	0	0	0
JOHNSON C SMITH	0	0	0	0	0	0	0	0	0	0	0	0
LIVINGSTONE COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
N C A&T STATE	850,000	0	7,000	53,018	602,000	58,500	0	508,118	0	0	687,178	2,112,196
N C CENTRAL	0	0	0	177,035	0	0	0	0	0	0	0	177,035
ST AUGUSTINE	0	0	0	0	0	0	0	0	0	0	0	0
SHAW UNIVERSITY	0	0	0	0	0	0	0	0	0	0	25,000	25,000
WINSTON-SALEM STATE	0	0	0	0	0	0	0	67,563	0	0	0	67,563
OHIO												
CENTRAL STATE	22,000	0	0	0	7,600	0	0	0	0	0	58,849	88,449
WILBERFORCE UNIV	66,000	0	0	0	9,340	0	0	0	0	0	62,000	137,340
OKLAHOMA												
LANGSTON UNIV	0	0	0	0	0	58,500	0	0	0	0	0	58,500

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	OTHER	TOTALS
PENNSYLVANIA												
CHEYNEY UNIV	0	0	0	144,648	0	0	0	0	0	0	0	144,648
LINCOLN UNIV	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH CAROLINA												
ALLEN UNIVERSITY	0	0	0	0	0	0	0	0	0	0	0	0
BENEDICT COLLEGE	200,000	0	0	0	0	0	0	0	0	0	0	200,000
CLAFLIN COLLEGE	72,609	0	0	0	64,940	0	0	0	0	0	13,000	150,549
CLINTON JR COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
DENMARK TECH	0	0	0	0	0	0	0	0	0	0	0	0
MORRIS COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
S C STATE UNIV	10,000	0	0	0	0	68,000	0	67,563	0	0	383,427	528,990
VOORHEES COLLEGE	0	0	0	0	0	0	0	0	0	0	10,000	10,000
TENNESSEE												
FISK UNIV	88,820	0	0	0	0	0	0	81,667	0	0	0	170,487
KNOXVILLE COLLEGE	0	0	0	61,935	0	0	0	0	0	0	0	61,935
MORRISTOWN CAMPUS	0	0	0	0	0	0	0	0	0	0	0	0
LANE COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
LEMOYNE-OWEN	0	0	0	162,804	0	0	0	0	0	0	0	162,804
MEHARRY MEDICAL	0	0	0	0	0	0	0	0	0	0	0	0
TENNESSEE STATE	1,435,000	8,000	46,900	0	5,000	0	0	155,556	0	0	0	1,650,456
TEXAS												
HUSTON-TILLOTSON	0	0	0	0	0	0	0	0	0	0	0	0
JARVIS CHRISTIAN	0	0	0	0	0	0	0	0	0	0	0	0
PAUL QUINN COLLEGE	0	0	0	0	0	58,500	0	0	0	0	0	58,500
PRAIRIE VIEW A&M	1,345,856	0	257,000	0	40,000	0	0	323,118	0	0	16,000	1,981,974
SAINT PHILLIP'S	0	0	0	0	0	0	0	0	0	0	0	0
SOUTHWESTERN CHRIST	0	0	0	0	0	0	0	0	0	0	0	0
TEXAS COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0
TEXAS SOUTHERN	72,000	0	0	0	4,200	0	0	67,563	0	0	0	143,763
WILEY COLLEGE	0	0	0	0	0	0	0	0	0	0	0	0

STATE/INSTITUTION	R&D	PE	TRAINING	F&E	FELLOWS	SFA	DIS	TPA	PSI	AI	*OTHER	TOTALS
VIRGINIA												
HAMPTON UNIV	1,191,994	0	7,000	0	45,832	0	0	155,556	0	0	0	1,400,382
NORFOLK STATE	58,000	0	0	0	0	0	0	0	0	0	0	58,000
SAINT PAUL'S	0	0	0	0	0	0	0	0	0	0	0	0
VIRGINIA STATE	0	0	0	0	0	0	0	0	0	0	0	0
VIRGINIA UNION	0	0	0	0	0	0	0	0	0	0	0	0
WEST VIRGINIA												
BLUEFIELD STATE	10,000	0	0	0	0	0	0	0	0	0	0	10,000
W VIRGINIA STATE	0	0	0	11,790	0	0	0	0	0	0	0	11,790
U.S. VIRGIN ISLANDS												
UNIV OF THE V I.	79,781	0	0	0	0	0	0	0	0	0	0	79,781
various	0	0	0	0	25,000	0	0	0	0	0	11,873,162	11,898,162
GRAND TOTAL	14,358,161	4,414,113	8,577,363	10,086,197	2,309,186	1,733,414	0	3,669,876	0	80,000	8,772,773	59,080,000

CATEGORIES

R&D - RESEARCH & DEVELOPMENT
PE - PROGRAM EVALUATION
F&E - FACILITIES AND EQUIPMENT
FELL - FELLOWSHIP, RECRUITMENT, IPA
SFA - STUDENT FINANCIAL ASSISTANCE
DIS - DIRECT INSTITUTIONAL SUBSIDIES
TPA - THIRD PARTY AWARDEES
PSI - PRIVATE SECTOR INVOLVEMENT
AI - ADMINISTRATIVE INFRASTRUCTURE

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Mr. Myers. How is funding allocated to Historically Black Colleges and Universities?

Mrs. Moody. Department funds are allocated to Historically Black Colleges and Universities either through the process of competitive awards of proposals for targeted Departmental programs, or through the "unsolicited proposal" process where the educational institution prepares a proposal to support a specific program or office within the Department with research, program development, or any feasible activity relevant to the mission of the Office. Proposals for competitive awards are evaluated according to the procurement procedures delineated in the published request for proposal notice and are evaluated and ranked by a review team. Unsolicited proposals are usually directed by the unsolicited proposal office to appropriate Departmental program office(s) for evaluation and determination of their specific merit. Acceptance of specific proposals is then determined by a review panel.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Mr. Myers. Are proposals reviewed by DOE or an external review panel?

Mrs. Moody. Proposals review panels are comprised of both internal and external individuals. Panel compositions will vary according to the technical level of complexity. The panels may be comprised of representatives from relevant program offices within the Department and/or our national energy laboratories, or they may include representatives from relevant national organizations with technical expertise in the particular area(s) of focus of the proposal and with in-depth knowledge of the mission and goals of the Department and the funding organizations.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Mr. Myers. What factors are used to measure performance and successful implementation of awards?

Mrs. Moody. Specific criteria are established for measuring the performance and successful implementation of each proposal which is awarded with Departmental funding. These criteria are usually included in the competitive award solicitation. For unsolicited awards, the criteria for measuring those elements are determined prior to deliberations of the review panel for funding. These criteria usually reflect specific goals, mission, and functions of the funding program office and the particular activity. The "success variables" of the performance measures are validated with specific information contained in the reports required by the Department in the "reporting requirements" segment of the grant to the educational institution. Following award, funding program offices conduct site visits and annual program reviews to measure performance.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

Mr. Myers. For fiscal years 1995, 1996 and 1997, please provide a detailed description of activities included in the Minority and Economic Impact program funding of $2.9 million. Provide the funding for each activity, and identify the contractor who performed the work or the recipient of the funding.

Mrs. Moody. In regard to the Minority Economic Impact program activities, listed below are detailed descriptions and names of contractors who performed the work.

SOCIOECONOMIC RESEARCH AND ANALYSIS PROGRAM

I. Detailed Description

The Socioeconomic Research and Analysis Program is mandated by P.L. 95-619. The program has continued at a significantly reduced level of effort to develop and enhance the analytical tools and software to (a) provide a credible quantitative framework for long-term analysis of energy environmental issues, (b) assist the Department in building a consensus on energy issues, (c) assess the impacts of energy programs, policies, legislative and regulatory proposals, (d) establish innovative methods by which massive energy and socioeconomic data base systems can be integrated for long-term analyses and forecasting of energy and environmental data and other information and (e) develop the of the distributional analysis module for the National Energy Modeling System for impact decisions by geographic regions and for various socioeconomic population groups. The program enhances the Department's decision-making capability by providing timely and cost-effective analyses on the comparative impact of policies, regulations and other actions; increases stakeholder awareness of energy issues affecting different population segments on a comparative basis; and facilitates the development of unique analytical tools to input equity considerations in the formulation and evaluation of energy policy.

II. Funding

Program Activity	FY 95 (in thousands)	FY 96 (in thousands)	FY 97 in thousands)	Contractor who Performed Work
Data Development and Minority Energy Assessment Models	$ 365	$ 380	$ 380	Argonne National Lab
Policy Assessments and Analyses	335	100	100	Argonne National Lab
Technical Market Analysis and Information	80	0	0	Argonne National Lab
Total, Research	$ 780	$ 480	$ 480	Argonne National Lab

MANAGEMENT AND TECHNICAL ASSISTANCE PROGRAMS

I. Detailed Description

The Office of Economic Impact and Diversity is mandated by P.L. 95-619 to provide Management and Technical Assistance to minority educational institutions and minority business enterprises to enable them to participate in market research, planning, economic and business analysis, and program and contract opportunities within the Department. The implementation of ED's program strategies for management and technical assistance can contribute significantly to the new incentives, goals and vision of the Department to technical and economic development strategies. To augment these efforts, the Minority Information Clearinghouse serves as a centralized repository and dissemination point. Technical assistance programs enhance minority participation in the energy technology industry by supporting the research and education infrastructure at minority educational institutions, and at all levels of their educational curriculum through improved scientific training and research activities in mathematics and sciences, for both students and teachers. In addition, the program assists with merging the technical resources of Federal and private sector laboratories and energy technology industries to assist underrepresented students to pursue careers in mathematics and science. Innovation and business entrepreneurship for various minority groups are encouraged to improve the level of competition in the energy arena. These programs enhance the technical capabilities of our Nation's human resources and facilitate the Department's contribution to heightening the Nation's energy, economic, and environmental needs among various underrepresented population segments.

II. Funding

Program Activity	FY 1995 (in thousands)	FY 1996 (in thousands)	FY 1997 (in thousands)
Minority Educational Institutions Support	$ 1,820	$ 1,735	$ 1,735
Minority Energy Information Clearinghouse	21	123	123
Minority Business and Community Development	294	382	382
Total, Management and Technical Assistance	$ 2,135	$ 2,240	$ 2,240

CONTRACTORS WHO PERFORMED WORK		
Program Activity	**Contractors (FY 1995)**	**Amount (Whole Dollars)**
Education Program Support	Fort Valley State College	$200,000
	African Electrification Foundation	250,000
	Minority on Line Information System	100,000
	Fort Peck Community College	67,000
	Southeast College	67,000
	Salish Kootnai Community College	67,000
	Maui Community College	67,000
	Greenville Technical College	67,000
	American Samoa Community College	67,000
	Hostos Community College	67,000
	Luna Vocational Institute	67,000
	Argonne National Laboratory	75,000
	L.A. Environmental Jobs Training	25,000
	African Electrification Foundation	75,000
	Sandia National Laboratory	100,000
	Minority Manufacturers	70,000
	Society of Hispanic Professional Engineers	20,000
	National Association for Equal Opportunity in Higher Education	178,000
	Foxworth & Dinkins, Inc.	25,000
	National Image, Inc.	20,000
	Mexican American State Legislators Policy Institute	75,000
	Self-Reliance Foundation	25,000
	Hispanic Radio Network	25,000
	Hispanic Assn. of Colleges & Universities	125,000
	National Assn. of Negro Business & Prof. Women's Clubs	25,000
	National Urban Coalition	100,000

Program Activity	Contractors (FY 1995)	Amount (Whole Dollars)
Education Program Support	Southeastern Consortium for Minorities in Engineering	$100,000
	100 Black Men of Los Angeles	75,000
	Seattle Community College	36,000
	New Jersey Institute of Technology	10,000
	Voorhees College	10,000
	Southern University	5,000
	Urban Policy Institute	20,000
	The Mitchell Group	101,000
Business Program Support	Unisphere, Inc.	100,000
Information Management	Ark Capital Mgmt.	25,000
	Illusion Threatre & School	21,000
Program Activity	**Contractors (FY 1996)**	**Amount (Whole Dollars)**
Education Program Support	Fort Peck Community College	$50,000
	Southeast College	50,000
	Salish Kootnai Community College	50,000
	Maui Community College	50,000
	Greenville Technical College	50,000
	American Samoa Community College	50,000
	Hostos Community College	50,000
	Luna Vocational Institute	50,000
	New Mexico Project Partnerhsip	40,000
	Texas Southern University	200,000
	National Assn for Equal Opportunity in Higher Education	180,000
	National Image, Inc.	40,000
	National Urban Coalition	200,000
	African Electrification Foundation	274,000

Program Activity	Contractors (FY 1996)	Amount (Whole Dollars)
Educational Program Support	Southeastern Consortium for Minorities in Engineering	$250,000
	Society of Hispanic Professional Engineers	100,000
Business Program Support	Sandia National Lab	30,000
Information Management	Career Communication	3,000
Program Activity	**Contractors Estimate (FY 1997)**	**Amount (Whole Dollars) (Estimate)**
Education Program Support	Fort Peck Community College	$50,000
	Southeast College	50,000
	Salish Kootnai Community College	50,000
	Maui Community College	50,000
	Greenville Technical College	50,000
	American Samoa Community College	50,000
	Hostos Community College	50,000
	Luna Vocational Institute	50,000
	New Mexico Project Partnership	40,000
	Texas Southern University	200,000
	National Assn. for Equal Opportunity in Higher Education	200,000
	Southeastern Consortium for Minorities in Engineering	250,000
	National Image, Inc.	20,000
	Society for Hispanic Professional Engineers	100,000
Business Program Support	Sandia National Lab	100,000
	Subtotal To-date: Awards to be determined: Total Allotment:	$1,310 + 1,590 $2,900

BANK DEPOSIT FINANCIAL ASSISTANCE PROGRAM

I. Detailed Description

The Bank Deposit Financial Assistance Program is mandated by P.L. 95-619, to provide short-term deposits of Federal funds in minority-owned financial institutions. Under this program, non-appropriated funds obtained through consent decrees in the Economic Regulatory Administration's Petroleum Violation Escrow Account are deposited in short-term certificates of deposit in minority financial institutions, to be used as additional capital for loans and investments in their respective minority communities. The following funding schedule reflects the funds required for the banks to administer the program for DOE.

II. Funding Schedule

Program Activity	FY 1995 (in thousands)	FY 1996 (in thousands)	FY 1997 (in thousands)
Bank Deposit Financial Assistance	$ 180	$ 180	$ 180
Total, Financial Assistance	$ 180	$ 180	$ 180

BANK DEPOSIT FINANCIAL ASSISTANCE PROGRAM

I. Funding

Contractor FY 95	Amount (Whole Dollars)	Contractor FY 96	Amount (Whole Dollars)	Contractor FY 97	Amount (Whole Dollars)
Adams National Bank	$5,500	Adams National Bank	$5,500	Adams National Bank	$5,500
American State Bank	5,500	American State Bank	5,500	American State Bank	5,500
AMSouth Bank	5,000	AMSouth Bank	5,000	AMSouth Bank	5,000
Bank of Oklahoma	5,500	Bank of Oklahoma	5,500	Bank of Oklahoma	5,500
Cathay Bank, Los Angeles	5,000	Blackfeet National Bank	5,500	Blackfeet National Bank	5,500
Citizens Bank, Maryland	5,200	Cathay Bank, Los Angeles	5,000	Cathay Bank, Los Angeles	5,000
City National Bank, NJ	5,100	Citizens Bank, Maryland	5,200	Citizens Bank, Maryland	5,200
Chase Bank of Maryland	5,500	City National Bank, NJ	5,100	City National Bank, NJ	5,100
California Korea Bank	5,500	Cole Taylor Bank	5,500	Cole Taylor Bank	5,500
Cole Taylor Bank	5,500	Crestar Bank, N.A	5,300	Crestar Bank, N.A.	5,300
Crestar Bank, N.A.	5,300	Crestar Bank, VA	5,500	Crestar Bank, VA	5,500
Crestar Bank, VA	5,500	Crestar Bank, MD	5,200	Crestar Bank, MD	5,500
Crestar Bank, MD	5,200	Far East National Bank	5,000	Far East National Bank	5,000
Far East National Bank	5,000	The Fifth Third Bank	5,500	The Fifth Third Bank	5,500
The Fifth Third Bank	5,500	First of American, IN	5,800	First of American, IN	5,800
First of American, IN	5,800	First Source Bank	5,000	First Source Bank	5,000
First Source Bank	5,000	First Union	5,500	First Union	5,500
First Security Bank, NM	5,500	First Security Bank, nm	5,500	First Security Bank, nm	5,500
Fleet Bank	5,000	Fleet Bank	5,000	Fleet Bank	5,000
Founders National Bank	5,300	Founders National Bank	5,300	Founders National Bank	5,300
Frost National Bank	5,400	Frost National Bank	5,400	Frost National Bank	5,400
Magna Trust Company	5,500	Magna Trust Company	5,500	Magna Trust Company	5,500
Manufacturers/Traders	5,500	Manufacturers/Traders	5,500	Manufacturers/Traders	5,500
Marquette National Bank	5,000	Marquette National Bank	5,000	Marquette National Bank	5,000
NationsBank of FL	5,200	NationsBank of FL	5,200	NationsBank of FL	5,200
NationsBank of Texas	5,400	NationsBank of Texas	5,400	NationsBank of Texas	5,400
Old National Bank	5,000	Old National Bank	5,000	Old National Bank	5,000
Seaway National Bank	5,200	Seaway National Bank	5,200	Seaway National Bank	5,200
Security Pacific	5,100	Security Pacific	5,100	Security Pacific	5,100
Signet Bank, VA	5,000	Signet Bank, VA	5,000	Signet Bank, VA	5,000
Society National Bank	5,800	Society National Bank	5,800	Society National Bank	5,800
Sun/Bank Miami	5,000	Sun/Bank Miami	5,000	Sun/Bank Miami	5,000

Contractor FY 95	Amount (Whole Dollars)	Contractor FY 96	Amount (Whole Dollars)	Contractor FY 97	Amount (Whole Dollars)
Sunwest Bank, NM	5,000	Sunwest Bank, NM	5,000	Sunwest Bank, NM	5,000
United National, NC	5,500	United National, NC	5,500	United National, NC	5,500
TOTAL	$180,000	TOTAL	$180,000	TOTAL	$180,000

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION

Mr. Myers How many small, minority, and women-owned businesses were issued contracts of what size in fiscal years 1994 and 1995?

Mrs. Moody. In Fiscal Year 1994 there were 1,180 contract obligations, ranging from 10 thousand to over 19 million dollars. In Fiscal Year 1995, there were 1,251 contract obligations, ranging from 10 thousand to 30 million dollars. The number of contracts does not include the Department's management and operating contractors as they are only required to report obligations and not the number of contracts awarded

Mr. Myers. Has the Department evaluated the effectiveness of this program to determine how many businesses helped with the program have successfully graduated from small and disadvantaged business category.

Mrs. Moody. The Office of Economic Impact and Diversity routinely receives procurement award information that could be used to measure progress toward successful movement from the small and disadvantaged business category. However, most of the small businesses employed by our Department are also doing business with other departments and agencies. The Small Business Administration is the repositor for information relating to small business size determinations and graduation data.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION

Mr. Myers. Please provide a list of the top 100 small, minority, and women-owned businesses who received funding in FY 1994 and 1995. Include the location of the contractor, the amount of the original contract award and the final cost of the contract.

Mrs. Moody. Attached are the list of the Top 100 Small Business Contractors for FY 1994 and 1995 arranged in descending order by amount of procurement obligations to each contractor. These lists do not include the Departments management and operating contractor data, as they are only required to report total subcontracting obligations and not individual subcontract awards.

Our current system does not allow generation of information on location of contractors, amount of contract awards or final cost of contracts.

c. TOP 100 SMALL BUSINESS CONTRACTORS

The top 100 small business contractors are arranged in descending order by amount of procurement obligations to each contractor during FY 1994. The top twenty-nine (29) of these are also included in the listing of DOE's top 100 contractors.

TOP 100 SMALL BUSINESS CONTRACTORS

CONTRACTOR NAME	NUMBER OF CONTRACTS	FY 1994 OBLIGATIONS ($000)
1. Analysas Corp.	4	$ 19,810
2. Scientech Inc.	9	14,127
3. MSE Inc.	1	13,900
4. M-C Power Corp.	1	13,082
5. Systematic Management Services	20	12,128
6. Energy Research Corp.	2	11,878
7. PAI Corp.	14	11,498
8. High Power Inc.	2	10,576
9. Molten Metal Technology Inc.	1	9,233
10. Enterprise Advisory Services	7	7,918
11. SRA Technologies Inc.	3	7,460
12. Source One Management Inc.	4	7,327
13. Protective Door Industries	2	7,247
14. Tresp Assoc. Inc.	9	6,528
15. Addison Construction Co.	7	6,202
16. Princeton Economic Res. Inc.	4	5,483
17. Comprehensive Technologies Intl. Inc.	1	5,385
18. Abacus Technology Corp.	2	5,324
19. Technology & Management Services	4	4,813
20. Advanced Sciences Inc. *	3	4,813
21. Tucker & Associates Inc.	1	4,809
22. Jupiter Corp.	6	4,566
23. McCarthy Construction	1	4,479
24. Facilities Management Co.	5	4,307
25. Hague International	2	3,958
26. Internet Systems Inc.	1	3,904
27. RECOM Technologies Inc.	2	3,833
28. Vortec Corp.	2	3,781
29. Labat-Anderson Inc.	1	3,762
30. Government Micro Resources	18	3,641
31. M.H. Chew & Associate	2	3,542
32. Response Analysis Corp.	1	3,292
33. LAM Associates Inc.	5	3,235
34. World Computer Systems Inc.	1	3,233
35. Ralph G. Moore & Associates	2	3,142
36. Jerry R. Bergeson & Associates	1	3,097
37. Columbia Services Group Inc.	2	3,075
38. Eng. Comp. Opteconomics Inc.	1	3,000
39. Naughton Energy Corp.	1	2,995
40. Energetics Inc.	5	2,903
41. Jason Associates Corp.	1	2,900
42. Puma Construction Co.	7	2,707
43. Bio-Imaging Research Inc.	1	2,661
44. Peddada Consultants Inc.	2	2,652
45. Walcoff & Associates	7	2,632
46. Dulles Networking Assoc. Inc.	2	2,590
47. Systems Flow Inc.	1	2,586
48. Decision Analysis Corp. of VA.	1	2,567
49. TC Enterprises Inc.	10	2,510
50. International Data Prod. Corp.	6	2,510

TOP 100 SMALL BUSINESS CONTRACTORS (Continued)

	CONTRACTOR NAME	NUMBER OF CONTRACTS	FY 1994 OBLIGATIONS ($000)
51.	PB Inc.	1	$ 2,507
52.	B. & S. Transport Inc.	1	2,500
53.	Greenbar Corp.	14	2,492
54.	Digital Systems Research	1	2,450
55.	ADC Ltd.	2	4,426
56.	H-Power Corp.	1	2,401
57.	American Technologies Inc.	2	2,295
58.	Aguirre Engineers Inc.	9	2,273
59.	Tri-Cor Industries Inc.	1	2,261
60.	American Line Builders Inc.	1	2,244
61.	Scott & Sons Maintenance Inc.	1	2,174
62.	Westar Corp.	1	2,160
63.	Camber Corp.	2	2,151
64.	Robert E. Rivera Construction Co.	9	2,150
65.	Vista Technology Inc.	2	2,140
66.	Alfa-Laval Separation	6	2,100
67.	Capstone Corp.	1	2,100
68.	ECS Technologies Inc.	13	2,039
69.	Salazar Assoc. International Inc.	2	1,978
70.	S. Powell Construction Co. Inc.	7	1,974
71.	Research Mgmt. Consultants Inc.	4	1,965
72.	KPI Corp.	12	1,951
73.	Dynamic Decisions Inc.	22	1,919
74.	Modern Technologies Corp.	1	1,886
75.	AM Pro Protective Agency Inc. *	1	1,878
76.	System Technology Associates	2	1,870
77.	Engineering Services Group PC	1	1,815
78.	META Inc.	4	1,800
79.	NEOS Corp.	3	1,788
80.	ENI Inc.	1	1,763
81.	Proteus Corp.	2	1,734
82.	Advanced Systems Tech. Inc.	2	1,710
83.	Gram Inc.	2	1,700
84.	Kira Inc.	3	1,684
85.	Kenrob & Associates Inc.	1	1,590
86.	CCS Laboratories Inc.	5	1,570
87.	MEC Construction Inc.	5	1,548
88.	Gonzales Consulting Services Inc.	1	1,544
89.	Space Power Inc.	1	1,529
90.	Pacific Western Technologies	1	1,455
91.	Sociotechnical Research Appl.	2	1,447
92.	Hazardous & Medical Waste Svc.	2	1,437
93.	Nuclear Filter Technology Inc.	9	1,432
94.	Elmwood Office Park	1	1,429
95.	Research Planning Inc.	2	1,394
96.	Cadmus	1	1,330
97.	Lundberg Marshall & Associates	1	1,329
98.	Tri-Ark Industries Inc.	1	1,329
99.	Inca Construction Co. Inc.	4	1,277
100.	Coopers & Lybrand	2	1,222

Does not match the number of contracts and FY 1994 obligations provided in the top 100 contracts list because this firm became a large business in FY 1994 or earlier.

TOP 100 SMALL BUSINESS CONTRACTORS

CONTRACTOR NAME	NUMBER OF CONTRACTS	FY 1995 OBLIGATIONS ($000)
1. MSE Inc	1	$ 30,879
2. Enterprise Advisory Services	10	12,821
3. PAI Corp	11	12,235
4. Scientech Inc	15	12,086
5. American Technologies Inc	2	11,527
6. Molten Metal Technology Inc	1	11,053
7. Kenrob & Assoc Inc	1	9,567
8. SRA Technologies Inc	2	8,400
9. Gram Inc	3	8,191
10. High Power Inc	7	8,184
11. Princeton Economic Res Inc	3	6,806
12. Source One Management Inc	4	6,024
13. Systematic Management Services	3	6,003
14. Nuclear Assurance Corp	1	5,400
15. Columbia Services Group Inc	3	5,302
16. Analysas Corp	4	5,291
17. Tucker & Associates Inc	1	4,943
18. S Powell Construction Co Inc	10	4,757
19. Capstone Corp	2	4,757
20. York Telecom Corp	36	4,717
21. System Technology Assoc	3	4,707
22. Abacus Technology Corp	3	4,512
23. Tresp Assoc Inc	3	4,483
24. Jason Assoc Corp	16	4,060
25. Response Analysis Corp	1	4,030
26. Jupiter Corp	6	3,925
27. Hague International	1	3,730
28. RECOM Technologies Inc	2	3,707
29. ENI Inc	1	3,672
30. Energetics Inc	4	3,640
31. Internet Systems Inc	1	3,511
32. Technology & Management Services	3	3,503
33. Gem Technology Inc	3	3,499
34. Aguirre Engineers Inc	23	3,457
35. Delphi Research Inc	1	3,364
36. Walcoff & Assoc Inc	6	3,349
37. M-C Power Corp	1	3,319
38. Vista Technology Inc	2	3,212
39. LAM Assoc Inc	6	3,180
40. Research Management Consultants Inc	4	3,086
41. Decision Analysis Corp of Virginia	1	3,003
42. World Computer Systems Inc	1	3,003
43. MEC Construction Inc	5	2,922
44. Camber Corp	4	2,909
45. Compa Industries Inc	6	2,864
46. Kira Inc	6	2,698
47. Gonzales Consulting Services Inc	1	2,619
48. Robert E Rivera Construction Co	24	2,609
49. Parallax Inc	2	2,569
50. Digital Systems Research Inc	3	2,476

TOP 100 SMALL BUSINESS CONTRACTORS (Continued)

	CONTRACTOR NAME	NUMBER OF CONTRACTS	FY 1995 OBLIGATIONS ($000)
51.	Peddada Consultants Inc	3	$ 2,440
52.	Mele Assoc Inc	3	2,426
53.	Mendez Inc	1	2,400
54.	Ralph G Moore & Assoc	2	2,393
55.	NCI Information Systems Inc	2	2,345
56.	Salazar Assoc International Inc	3	2,315
57.	H-Power Corp	1	2,291
58.	Sorenson Enterprises Inc	1	2,279
59.	Tri-Cor Industries Inc	1	2,277
60.	Research Planning Inc	2	2,269
61.	L S Gallegos & Assoc Inc	1	2,161
62.	Critique Inc	1	2,139
63.	Energy Research Corp	2	2,116
64.	Garcia Consulting Inc	1	2,093
65.	Centec-21 Inc	1	2,088
66.	Westar Corp	1	2,065
67.	Modern Technologies Corp	1	2,000
68.	Vortec Corp	1	1,987
69.	DN American	19	1,962
70.	Neos Corp	3	1,843
71.	Great Southwestern Construction Co	2	1,823
72.	Allied Technology Group Inc	4	1,813
73.	Labat-Anderson Inc	3	1,757
74.	Lee Assoc	2	1,734
75.	Govt Micro Resources Inc	13	1,697
76.	Addison Construction Co	8	1,542
77.	Soza & Co Ltd	2	1,534
78.	Sociotechnical Research Applic	2	1,505
79.	Integrated Support Systems Inc	1	1,500
80.	Internatl Development & Resources Inc	1	1,500
81.	Signal Corp	1	1,471
82.	Pacific Western Technologies	1	1,470
83.	Tri-Ark Industries Inc	1	1,427
84.	Advanced Resources Intl Inc	3	1,409
85.	Mirage Systems	2	1,398
86.	Lundberg Marshall & Assoc	2	1,388
87.	ERM Program Management Co	9	1,382
88.	Greenbar Corp	7	1,381
89.	Logistics Applications Inc	5	1,374
90.	Asta Engineering Inc	2	1,373
91.	Elmwood Office Park	2	1,356
92.	Hazardous & Medical Waste Svc	2	1,318
93.	C & W Enterprises Inc	8	1,317
94.	Proteus Corp	1	1,310
95.	Correa Enterprises Inc	2	1,260
96.	Computer Products Inc	4	1,259
97.	Morrison Construction Services Inc	2	1,184
98.	ENG Comp Opteconomics Inc	1	1,173
99.	Dulles Networking Assoc Inc	6	1,173
100.	M H Chew & Assoc Inc	1	1,152

Mr. Myers. What percentage of these contracts are competitive versus sole source procurement at Headquarters and through the M&O contractors?

Mrs. Moody. The Department's procurement data system is currently not programmed to provide the percentage of the top 100 small, minority and women-owned businesses awards that were competitive versus sole source. We will provide this information by the end of April 1996.

Mr. Myers. What percentage of these contracts are cost base versus performance-based and what action is the Department taking to ensure all contracts awarded are performance based with clear penalties for poor or non-performance.

Mrs. Moody. The Department's current Procurement Data system provides results only for all small business contracting actions and is not designed to report the top 100 small, minority and women-owned by type of contract award. We are improving our data collection systems to reflect your request.

In fiscal year 1994, total small business results found that fixed price contracts were 46 percent of the small business contracts, 38 percent were cost plus award fee contracts and 16 percent were labor and time material contracts. In fiscal year 1995, fixed price contracts represented 51 percent, 36 percent were cost plus award fee contracts and 13 percent were labor and time material contracts.

Driven by such mandates as the National Performance Review, the Government Performance and Results Act, the Federal Acquisition Streamlining Act of 1994 and Secretary O'Leary's Contract Reform Initiatives, the Department has taken a leadership role in reinventing business systems. Our strategy has been to focus on the following areas.

- Government-wide Procurement Reform - We have proactively supported government-wide initiatives for procurement reform. We are committed to implementing the Federal Acquisition Streamlining Act of 1994. We have made great strides in employing electronic commerce and purchase cards.

- Contract Reform - We have successfully employed performance based contracting concepts and methodologies in major management and operating contracts. In Fiscal Year 1996, we will continue testing performance based contracting, for the first time, in small business and 8(a) procurement.

- Procurement Oversight - We have been aggressive in changing the traditional paradigm of procurement oversight from one of process compliance and conformance to one that emphasizes performance, results and customer satisfaction by fostering "best value" source selection techniques and the use of past performance evaluation factors, site visits and annual program reviews.

For Fiscal Year 1996, our strategic objectives are to create a responsive procurement system that places a priority on results, one that is less costly and is customer driven.

OFFICE OF POLICY

Mr. Myers. Describe the work of the Department's privatization team.

Mr. Reicher. Secretary O'Leary established the Privatization Working Group in October, 1995. They were tasked to support the many privatization efforts ongoing in the Department by developing both a Department privatization policy and survey of privatization opportunities, and striving to overcoming obstacles to privatization. The Department of Energy expects to finalize and publish its policy report and inventory by May, 1996.

Mr. Myers. Identify all the internal Departmental operations which were eliminated and turned over to the private sector

.

Mr. Reicher. Since this question is not bounded in any way it could potentially include all internal operations, past or present, performed by the private sector across the DOE complex. If this is the information sought it would be an arduous task to perform. DOE proposes to meet with Committee staff to discuss DOE's progress in institutionalizing improved accounting procedures in relation to privatization and other management functions.

Mr. Myers. What was the cost of performing each activity in-house versus out-sourcing it?

Mr. Reicher. As stated in the previous answer, since this question is not bounded in any way it could potentially include all internal operations, past or present, performed by the private sector across the DOE complex. If this is the information sought it would be an arduous task to perform. DOE proposes to meet with Committee staff to discuss DOE's progress in institutionalizing improved accounting procedures in relation to privatization and other management functions.

Mr. Myers. Please describe the current excess inventory of precious metals.

Mr. Reicher: We will provide for the record a table, which shows the metals that have been declared excess to programmatic requirements by 28 DOE contractors as of 4/2/96:

Metal	**Quantity Gross Wt. (Tr. Ozs.)**	**Estimated Wt. (Tr. Ozs) of Processed Product**
Silver	3,720	2, 976
Platinum	5,334	4,267
Gold	1,675	1,340
Rhodium	3,536	2,829

Iridium	100	80
Palladium	4,376	3,501
Ruthenium	1,395	This metal not economical to process.

Mr. Myers. What is the initial cost of each class material in the inventory?

Mr. Reicher. Precious metals were purchased many years ago. Information pertaining to the original purchase price, as we declare precious metals in excess to current programmatic needs, is virtually impossible to obtain. If, however, we discover any historical information as we prepare each sale, we will of course make that information available.

Mr. Myers. What is the actual or estimated revenue from the sale of each class of material in inventory?

Mr. Reicher. We will provide a table for the record, which will include the estimated revenue from the sale of each class of material in inventory.

Metal	**Quality After Processing (Troy Ozs)**	**Market Value* ($)**
Silver	2,976	$ 16,368
Platinum	4,267	1,766,644
Gold	1,340	535,859
Rhodium	2,829	933,522
Iridium	80	5,623

Palladium	3,501	490,062
Ruthenium	(This metal not economical to process)	
TOTALS	***18,742***	***$ 3,748,078***

* As of 4/2/96

Mr. Myers. What is the schedule for selling these assets?

Mr. Reicher. The first sale in Phase II will begin on 6/15/96 and be confined to reprocessed precious metals. The second sale in Phase II will be conducted after determination of whether greater proceeds would be expected if the precious metals scrap would be re-processed, or sold directly. We anticipate completion of the second sale before the end of FY 1996.

OFFICE OF POLICY

Mr. Myers. Describe the budget request for Policy Analysis and Systems Studies, and Environmental Policy Studies. For each of fiscal years 1995, 1996 and 1997, please list each study, provide a brief description of the study, identify the contractor who performed (or will perform) these studies, and the cost of the study.

Mr. Reicher. The budget request for Policy Studies, and Environmental Policy Studies are used to generate analysis and support critical to the policy mission. The majority of this analysis and support is from outside sources, such as the National Laboratories, academia, and specialized technical contractors. Topics addressed include evaluation of proposed legislation and regulations potentially affecting the energy system and DOE programs, economic and environmental modeling to assess the energy and other impacts of climate change policy, and analysis of alternative fuel options. These studies, which tap expertise of leading national experts, leverage the effectiveness of the Office in internal and interagency policy development processes. Attached for the record is a detailed table for fiscal years 1995 through 1997 which contains the information requested. While FY95 and FY96 figures are the actual expenditures, FY97 figures are only presented for those current projects with FY97 funding commitments or can reasonable be expected to continue into FY97. The Policy Office undergoes an intensive analytic project identification process each year beginning in August to select the actual studies to be undertaken in the following fiscal year. Consequently, because of the fluid nature of policy and issue development, the new projects for FY97 have not yet been identified.

Mr. Myers. What special expertise is needed to perform these studies that is not available in the Organization?

Mr. Reicher. The Policy Office recently conducted a review of contract and national

laboratory support to determine what type of skills were being purchased. The study obtained and evaluated data from all eight large contractors and most of the laboratories that support the Office. Overall, submissions by the contractors/labs comprised 91,515 person hours, the equivalent of 44 FTEs.

Of the total contractor/lab hours:

- Engineering (23%), economist (19%), and operations research (12%) were the top technical categories. In the Policy Office, engineers comprise about 5% of staff and economists about 15%, and operations research analysts about 5%.

- Among the contractor/lab hours, foreign affairs, international relations, and language specialties comprise less than 3% in total, but are about 12% of PO staff.
- About 5% of both PO staff and contractor/lab hours are classified in the general area of "policy analyst".

The study shows that the distribution of PO's staff job classifications is decidedly different from the distribution of contractor/lab skills purchased. The contractor skills indicate the type of skills the PO staff should have available to accomplish its objectives, and should strive to obtain or retain in the future. Nevertheless, they are not present now. In the meantime, contractors and labs provide a compendium of specific skills that PO temporarily needs from time to time to address specific issues.

Mr. Myers. In an organization of 172 employees, why are these skills not available internally?

Mr. Reicher. Contractor skills are a compendium of specific skills that the Policy Office temporarily needs from time to time to address specific issues. Special expertise is needed in the arena of social sciences, physics, languages, science and technology, history, foreign affairs, statistics, economics, engineering, and business in general, to perform these studies.

One advantage of utilizing contractor support is being able to access top experts in varying technical disciplines and receive the benefits of independent, up to date analysis, giving credence and quality to the Policy Office's ultimate work products. The Policy Office does not need to "own" these skills on a permanent basis.

The Policy Office staff will continue to be broadly interdisciplinary, relying on Contractor/Lab study efforts as emerging issues direct and budget permits. The nature and background of the PO staff, coupled with lower budgets, suggest that the Policy Office will be increasingly reliant on other offices, agencies, or privately funded studies to provide its technical support. As follow on to the process improvement team's efforts described previously, the Policy Office is in the process of redirecting its skills base in order to build the capability to perform more in-house analytical efforts. However, its international responsibilities and the need for administrative and clerical support will not allow for the total substitution of technical skills available from outside sources.

Program Office	Vendor	Policy Analysis/System Studies/Environmental Policy Studies	FY 95	FY 96	FY 97 Expected
Electricity Policy					
Study on Stranded Benefits	Oak Ridge National Lab	A study examining how electricity services can be provided to low-income customers in a more competitive electricity industry, through the use of a universal system benefits charge as a means to fund these services.	35	50	
Electricity Reliability Study	Massachusetts Institute of Technology	A study examining how changes in generation and load affect grid reliability.	25	0	
Regional Electricity Markets	SAIC	* A study to identify and address issues related to the formation of regional power pools and spot markets for electricity in the U.S.	75	42	50
	CECA	* Participation in discussions sponsored by the Consumer Energy Council of America to identify an electricity market structure that will result in sustainable, competitive markets with broad sharing of benefits among consumers.	0	12.5	12.5
	Lawrence Berkeley	* An analysis by Lawrence Berkeley Laboratory of regional electricity generation markets and transmission interconnections sufficient to mitigate power.	0	25	25

NARUC Electricity Committee	National Association of Regulatory Utility Commissioners	Support for studies and analysis to assist State regulatory commissions in designing new regulatory mechanisms for the electricity industry that will achieve economic savings and retain societal benefits historically provided by electric utilities.	155	30	155
National Electricity Forums	Keystone Center/ Oak Ridge Nat. Lab	Public conference sponsored jointly with the National Association of Regulatory Utility Commissioners to review electricity industry restructuring issues and identify and coordinate needed electricity policy analysis.	38	45	25
Harvard Group	Harvard Electricity Policy Group	Participation in bi-monthly meetings to review fundamental policy issues confronting the electricity industry, its Federal and State regulators and other agencies.	25	25	25
Keystone Electricity Dialogue	Keystone Center	Bi-monthly meetings with electricity industry officials and regulators to discuss issues affecting the electricity industry including restructuring changes occurring due to reduced regulation and increased use of competition for generation resources.	23	25	25
Electricity Restructuring Environmental Mitigation	Oak Ridge Nat. Lab	Explore various policy issues related to electricity industry restructuring impact on competition, rates and service and environmental implications.	0	0	200
Oil and Gas Policy Oil Import Study	Technology & Management Services, Inc.	Implementation of the Administration's Domestic Natural Gas and Oil Initiative through study of benefits and costs of oil imports.	80	10	

Resolve Conflicts Over Access to Public Lands	Argonne National Lab	Implementation of the Administration's Domestic Natural Gas and Oil Initiative through analysis of public lands issues.	55	55	55
Interagency Coordinating Committee on Oil Pollution	Interagency Coordinating Committee on Oil Pollution	Implementation of the Administration's Domestic Natural Gas and Oil Initiative through participation in oil spill research.	10	0	
Application of Risk Analysis Tools/Transportation	Idaho National Engineering Lab	Implementation of the Administration's Domestic Natural Gas and Oil Initiative through study of risk analysis tools related to oil transportation.	45	0	10
Tribal Decisions on Oil and Gas	Oak Ridge National Lab	Implementation of Administration's Domestic Natural Gas & Oil Initiative relating to working with Native Americans' energy requirements.	40	25	10
1996 Cooperative International Workshop	Primatech, Inc.	Implementation of Administration's DNGOI relating to offshore oil and gas development.	0	15	
Education & Grants to Institutions	International Center for Energy and Economic Development	Follow-up to the National Petroleum Council's Future Issues report of August 1995--education and outreach.	15	15	15
Education & Grants to Institutions	International Association for Energy Economics	Follow-up to the National Petroleum Council's Future Issues report of August 1995--education and outreach.	50	21	10

Coastal Zone Conference	Coastal Zone Management	Follow-up to the National Petroleum Council's Future Issues report of August 1995--education and outreach.	10	10	10
Value of Oil and Gas Reserves	Massachusetts Institute of Technology	The Administration's energy policy emphasizes and reinforces the dominant role of the private sector and supports expanding the role of markets in several key areas. The Oil Policy Office analyzes developments, problems, and opportunities in oil markets, responds to Departmental needs for oil market expertise to fashion Administration oil market policies, analyzes those of others, and identifies and helps remove barriers to the efficient functioning of oil and gas markets.	20	20	10

Domestic Natural Gas & Oil Initiative	Argonne National Lab	The Domestic Natural Gas and Oil Initiative set out six State regulatory initiatives intended to remove State impediments to the increased use of natural gas. The DNGOI also identified a need for additional regulatory analysis on the secondary market for interstate natural gas pipeline capacity and the impact of future electric market structure on natural gas demand. Because of the brevity of the original report, it was difficult to convey to the reader exactly what the initiatives addressed. In an effort to better convey these ideas, the Natural Gas Policy Office is assembling a report on the six State initiatives. Likewise, reports will be issued on the secondary market and the electric restructuring. These reports will provide more detailed analyses of the issues and recommendations relating to State and Federal policies affecting natural gas use.	95	70	100

Fifth Annual DOE/NARUC Natural Gas Conference	Jack Faucett & Assoc.	The DOE and the National Association of Regulatory Utility Commissioners will host a conference on State and Federal regulatory issues. This conference will be held in late April 1996 in St Louis, Missouri. The conference promotes education and cooperation among industry members, State and Federal regulators and other industry officials. It is expected that approximately 1,000 participants will attend this conference. A record of proceedings will be published after the conference is compieted. In addition, the Natural Gas Policy Office will organize workshops, video conferences and other educational forums, in an effort to promote regulatory reform to improve economic efficiency.	0	70	100
Domestic Natural Gas Collaboratives	Advanced Resources, Inc.	DOE has entered into collaborative efforts with the Illinois Commerce Commission and the Wyoming Public Service Commission to work on regulatory reforms that are part of the Domestic Natural Gas and Oil Initiative. These cooperative agreements are established to improve the economic efficiency of regulatory policy in a more competitive energy market. The Natural Gas Policy Office will complete these collaborative efforts and enter into new collaboratives, as requested by State Commissions. In each case, the deliverable will be a report, assembled jointly by DOE and the State Commission, that analyzes the options the Commission should consider.	60	50	100

Economic Analysis & Competition					
NEMS Energy Modeling	AES Corp.	This project allows the Policy Office to utilize the National Energy Modeling System to perform regional policy analyses. Analyses to be performed include: regional impacts of climate change activities and regional impacts of changes in tax policy.	150	165	200
MARKAL-MACRO Analysis	Brookhaven National Lab	The Markal-Macro model is used to analyze potential energy savings from new and existing technologies and the costs of reducing carbon emissions. This project maintains and updates the existing U.S. energy system database within the model and works with other countries to enhance the model structure and methodology.	50	50	50
Analytical Phase for Berlin Mandate	Oxford Economics Forecasting, USA	Provide reports on the effects of global energy and environmental policies on US economic growth, industry competitiveness, and employment. Enhance the capability of the model and keep the data base up-to-date.	110	75	100
Macroeconomic Analysis for Climate Convention	DRI	DRI will analyze the macroeconomic implications of alternative next steps regarding the limitation of greenhouse gas emissions from energy use in industrialized countries.	50	50	50

Least Cost Energy Strategy	Brookhaven National Lab	EPACT requirement to evaluate energy strategy that minimizes energy costs of providing energy services to the nation.	250	0	
Conservation Potential	Argonne National Lab	Evaluate economic decision making with respect to uncertainty of energy savings.	25	0	25
Regulatory Supported Turnover of Energy Sector Capital	AES, Inc.	This study provides evaluation of how different regulations may impact the economic operation of utility plants.	150	0	
Regulatory Analysis/Ozone Standard	AES Inc.	This project in evaluates EPA's Regulatory Impact Analysis for a revised National Ambient Air Quality Standard for tropospheric ozone (smog). Attainment of a substantially revised standard would have major energy implications, such as the imposition of California-style mobile and stationary source controls in all major U.S. cities.	0	45	40
International Macroeconomic Modeling	Oxford Economics Forecasting, USA	Oxford Economics has developed a detailed energy sector to complement its international macroeconomic model. This tool is uniquely suited to analyze the short-run global effects of emissions reduction policies.	100	175	150
Electric Restructuring: Impacts on Greenhouse Gas	AES Inc.	This activity provides analyses using a detailed representation of the electric power industry that directly represents power control areas. This activity will also consider other, non-greenhouse gas, pollutants.	150	155	150

Operations Research Support	AES Inc.	This project acquires contract support for the MARKAL and IDEAS energy models that figure prominently in the Interagency analysis plan approved by the NSC-led climate policy group. The necessary support requires a combination of strong operations research skills, computer skills, and energy expertise that is unavailable within the PO staff. Hiring is not an option under current time and personnel budget constraints.	300	140	300
Pay at the Pump	Lawrence Berkeley National Lab	Reviewed options of paying for insurance as an component of the price of fuels.	25	0	
Analyze World Energy Markets	Central Intelligence Agency	Analysis of the impact of various greenhouse gas stabilization policies on world economies and energy sectors.	90	50	80
Validate Energy Models	Energy Information Administration	Provides reviews of energy modeling projects. Compares various greenhouse gas models and other energy	25		25
Policy Changes on Tax and Federal Land	AES, Inc.	Effects of policy changes on tax and federal land on U.S. economy and energy industry.	30		
Ideas Model Support for Climate Activities	AES Inc.	Activity provides resources to meet the needs of the Climate Change Update Report and the Interagency Plan for the "Analysis and Assessment" approved by the NSC-led climate policy group.	100	200	200

Implications of Outsourcing Energy-Intensive Products for Climate Negotiations	Batelle Pacific Northwest Lab	This project will develop a methodology for examining the carbon emissions impacts of outsourcing industrial production and apply it in a simulation setting to a four-region world -- developed and resource-rich (e.g. the U.S.), developed but resource-poor (e.g. Japan), major Asian developing countries (e.g. China), and the Rest of the World. Additional funding and time would be required to extend this framework to a more detailed regional specification with region-specific input/output information. The extension would make sense if the first project is successful and it looks like outsourcing issues are key to domestic and international negotiation and ratification processes.	0	65	200
Impacts of Climate Policy on Employment	CONSAD	Congress and the Administration will continue to be interested in the employment impacts of potential new commitments to reduce greenhouse gas emission pursuant to the Framework Convention on Climate Change. This analysis will develop a methodology for the consideration of employment impacts of climate change policies and estimates of the impacts of various scenarios.	75	50	80

Effects of Climate Policy on Energy-Intensive Industry	Argonne National Lab	This project will develop a series of papers by industry experts to assess the effects of emissions limitation policies on six energy-intensive industries in the United States. Each paper will then serve as the focus for a half-day workshop involving analysts, from industry, trade association unions, environmental groups, academia, and the financial community. Information developed through the papers and workshop discussion surrounding them will complement the aggregate modeling studies, which do not incorporate the wealth of detail that industry specialists and sector-focused analytic tools can provide.	45	200	200
Environmental Analysis & Sustainable Development					
Legislative Monitoring/CWA & SDWA	Argonne Nat. Lab	Analysis of economic and environmental impacts of CWA legislative proposals dealing with takings, wetlands delineation and permitting, use of cost/benefit, energy, and risk assessment considerations in setting permit limits and standards, antibacksliding, and intake credits; analysis of economic and environmental impacts of legislative proposal dealing with standard setting, source water protection, underground injection, and federal facility enforcement.	150	60	200
Legislative and Regulatory Analyses/Ecosystem Management	Argonne National Lab	Analyses of ecosystem management principles and effects on Endangered Species Act legislation and DOE programs.	50	0	

Legislative and Regulatory Analysis/Solid Waste	Argonne National Lab	Finish analyses of solid waste definitions, ash management, normally occurring radioactive materials	95	0	
Environmental Technology Initiative	Argonne National Lab	Develop alternative regulatory multi-media approaches for next generation refineries (Equal funding from DOE's Office of Fossil Energy and $100K grant from EPA.) This multi-phased project will conclude in FY 97.	50	0	100
Legislative and Regulatory Analysis/Risk Assessment and Cost Benefit Methods	Argonne National Lab	Analysis to develop new way to estimate information necessary for a cost benefit analysis of emissions at utilities	30	0	
Improving Air Quality with Paso del Norte	Los Alamos National Lab	Los Alamos and Sandia labs are working with regional groups to characterize, model and reduce air pollution in region	50	50	50
Clean Air Act Title V Operating Rules	Argonne National Lab	Analyses of issues for energy facilities in getting permits under CAAA Title V.	45	0	
Legislative and Regulatory Analysis/Clean Air Act Amendments (CAAA) Mobil Sources	Argonne National Lab	Analysis of economic and environmental impacts of Clean Air Act Amendment regulations on energy facilities.	100	0	

Legislative Implementation/NAAQS	Argonne Nat. Lab	Multiple National Ambient Air Quality Standards (NAAQS) are under review now by EPA for revision and tightening. These include ozone, PM, NOX, and SO2. EPA is beginning a special subcommittee of the Clean Air Act Advisory Committee to discuss the implementation issues if ozone, PM, and regional haze standards were changed. These would have strong effects on energy consumers, especially through powerplants. EPA has asked DOE Policy to serve on this subcommittee.	0	60	150
Legislative Implementation/TRI	Argonne Nat. Lab	Identification and impacts analysis of issues on EPA's proposal to expand EPCRA TRI reporting to energy industries, including: steam electric power, coal mining and oil & gas extraction.	0	20	
CAAA Mobile Source Regulations	Argonne Nat. Lab	Evaluation of CAA mobile source regulations involving the toxic emissions of transportation vehicles.	50		

Legislative and Regulatory Analyses/CERCLA and RCRA	Argonne Nat. Lab	Analysis of CERCLA/RCRA legislative proposals; studies for risk assessment portions of Superfund modelling effort.	50	60	60
Analysis/RCRA Corrective Action Rule Reproposal		Production of a series of analyses relating to EPA's expected reproposal of major portions of the RCRA Corrective Action Rule Analyses would address issues under rulemaking related to risk, cost, and the impact of compliance responsibilities on the regulated community.	50	60	150
Legislative Monitoring/Risk Assessment for NORM	Argonne Nat. Lab	Completion of work begun during FY '95 on risk assessment for Naturally Occurring Radioactive Materials (NORM) in the petroleum industry.	13	30	
Assessment/Long-Range Air Pollution (LRTAP)	Argonne Nat. Lab	Examine the various protocols LRTAP will propose for international conventions to control emissions of heavy metals, POPs and NOx. Consider the impact the protocols might have on energy sector industries and energy-intensive industries. Estimate how far existing U.S. environmental policy goes toward fulfilling the objectives of proposed LRTAP protocols.	20	20	50

Global Environment					
Integrated Assessment Support for Global Change	Carnegie-Mellon University	This activity will involve external contract to provide support for PO participation in the CENR Subcommittee on Global Climate Research (SGCR) and other aspects of international climate policy. In-house modeling capability will be developed with assistance from the contractor based on several existing integrated assessment (IA) models and applied to provide policy analysis capabilities, provide direct interactions with interagency and extramural assessments and model development, and ensure a realistic appraisal of assessment capabilities and issues for defining research needs and addressing assessment implementation issues. Further extramural support will provide expert consultation and programming assistance to modify and use IA models.	0	25	40
Feasible Policies to Reduce Air Emissions/China	Lawrence Berkeley Lab	Lawrence Berkeley Laboratory will work with the Energy Research Institute in China to develop analysis of policy measures in the Chinese context that would reduce greenhouse gas emissions. A report will be made available to DOE	50	40	
Second Generation Model of Global Change	Batelle Pacific Northwest Lab	Support the continued development of the Second Generation Model of Human Activity and Global Greenhouse Gas Emissions. The model will address numerous policy relevant issues such as effects of fiscal and regulatory policies on greenhouse gas emissions	220	50	100

Analysis to Support Domestic Options	Batelle Pacific Northwest Lab	The UN Framework Convention on Climate Change (UN, 1992) calls on nations to reduce their greenhouse gas emissions to 1990 levels by 2000 and stabilize them into the next century. This project will continue to develop domestic options for achieving post-2000 emissions reductions and analyze their potential efficacy in terms of climate change and other effects (cost, environmental impacts, etc.). This work also supports the analysis and assessment activities under the convention. A number of options such as energy technology development, voluntary incentives, etc. will be analyzed.	125	125	150
Developing and Analyzing New Protocol Concepts	Batelle Pacific Northwest Laboratories, Environmental Defense Fund	This activity would analyze issues surrounding the development of new protocols. These issues would include: methods for adjusting country commitments based on projections of emissions versus actual emission levels, tracking baseline programs and new climate change programs separately to avoid double counting baseline programs as new climate change programs, possibility of results-oriented technology development commitments focused on achievement of cost-reduction milestones rather than expenditure levels.	50	90	130
Regional Approaches to Climate-Conceptual Development	Batelle Pacific Northwest Lab	This activity would analyze the impact that various regional level commitments to climate change mitigation policies would have on national and international estimates of greenhouse gas emissions.	125	50	100

U.S. Country Studies Program	Argonne Nat Lab	Support of general circulation modeling data and projections, interpretation and application of global climate implications of climate scenarios to country studies, crop modeling and adaptation, water resource modeling and adaptation, for impact modeling.	125		
U.S. Country Studies Program	Lawrence Berkeley Lab	Technical support to the greenhouse gas mitigation analysis for developing countries.	205		
Support Framework Convention and Intergovernmental Panel on Climate Change	Batelle Pacific Northwest Lab	The U.S. government calls upon the Department (and other agencies) to support international climate activities, including workshops, meetings, and experts. This project provides resources to meet these needs. It includes a built in "strategic reserve" to address negotiating contingencies.	200	150	150
Energy Efficiency and Alternative Fuels Policy					
Initiate Fuel Economy Cost Study	Jack Faucett Associates, Inc.	This study provides technical support to improve our understanding of fuel economy technology costs and narrow the existing bands of uncertainty, as highlighted in the 1993 National Research Council study and 1995 "Car Talk" process.	100	55	25

Alternative Fuel Market Transition Analysis	Oak Ridge Nat. Lab/Argonne Nat. Lab	Year two of study of costs of and policies needed to complete a transition to widespread availability of alt fuels and vehicles. In year 2, model will be enhanced and full analysis undertaken (First year analysis will yield fully operational modeling system and some preliminary analysis).	100	100	30
Analysis of Transition from Corn to Ethanol	Argonne Nat. Lab	This will complete multi-year joint (w/EE) project on characterizing the likely scenarios under which cellulosic-based ethanol (DOE/EE R&D product) will penetrate the motor fuel markets. The analysis will also serve as basis for supporting a "Car Talk" bio-fuel policy recommendation.	50	30	
Support for IPCC Second Assessment Report	Argonne Nat. Lab	This report is required by the IPCC every five years on the assessment of the state of knowledge of the science, technologies and economics of climate change.	100		
Analysis for Cleaner Transportation	Oak Ridge Nat. Lab	Continuing technical and economic assessment and support of EPA clean fuel regulatory activities, e.g., work on OSTP Oxygenated Fuels Task Force, RFG-related testimony, and WTO case against U.S. RFG rule and development of new EPA regulations on gasoline sulfur and diesel fuel quality. Small DOE funding has large leverage on EPA $.	190	50	100

Modeling Consumer Behavior/Building Energy	Jack Faucett Associates, Inc.	Energy demand in buildings appears to be growing faster than recent projections had predicted. Limitations of existing residential energy market in explaining changes in consumer demand for energy services were evident in the Post-2000 analysis effort. This project would add features to current models so as to permit analysis of consumer responsiveness to specific policy-induced changes in residential energy markets. This project would develop a sufficiently-rich characterization of residential energy behavior that policies designed to address specific types of consumers and decisions could be evaluated. This will allow consideration of policies directed towards aspects of energy demand such as fuel choice, home size and remodeling decisions. The project would build in part on the 2-stage decision making framework for assessing voluntary programs mentioned elsewhere in this listing.	105	30	50

Model for Savings from Industrial Energy Policies	Energetics, Inc./Batelle Pacific Northwest Lab./Jack Faucett & Assoc.	The objective of this project is to develop and implement a market penetration model capable of endogenous estimation of the likely future energy savings and timing of impact for policy analysis that results from DOE industrial energy efficiency policies and programs. The project will include developing DOE's first ever market penetration model tool, assembling and utilizing bottoms-up data, and conducting model runs. Estimates produced by the market penetration model will be integrated into a formal industrial model, such as the IDEAs model or EIA's NEMS Industrial Model to produce more reliable estimates of the magnitude of likely energy savings impacts of government policies on industry. This multi-year project follows-up on the model development recommendations from a previous PO-64 project - Blueprint for a proposed market penetration model for industrial energy efficiency options analysis - that assessed PO industrial efficiency policy analysis needs, reviewed market penetration modeling techniques, and recommended a modeling structure for future development.	85	35	50

Development of DOE Regulatory Policy Guidance	Jack Faucett & Assoc.	This analysis would examine the effectiveness of various alternative fuels incentives, including vehicle credits, CAFE credits, fuel taxes, vehicle taxes, vehicle subsidies and other measures to put AFVs on the road and increase the use of alternative fuels. This study would provide a good off-the-shelf document for DOE to use to evaluate potential alternative fuel policy incentive and programs.	20	10	
Outside Experts Task Force on Climate Analysis	Lab Oak Ridge Nat.	The White House has requested that DOE and EPA establish a group of outside experts to consider key issues related to climate policy and opportunities for reducing emissions through efforts to address market failures and barriers. This activity would support a workshop on the subject.	0	50	50
Analysis and Assessment of Policies and Measures to Address Climate Change (incl: OECD/IEA project on Common Measures)	Batelle Pacific Northwest laboratory	As part of the negotiations of next steps under the Framework Convention on Climate Change, the Parties are conducting an analysis and assessment phase. Among the approaches under consideration by the Parties are agreements on individual policies and measures. This study conducts an assessment of the state of knowledge of individual policies and measures in expectation of providing the results to the Conference the Parties at its second meeting in July.	0	425	250

Industrial Efficiency Options Analysis	Jack Faucett & Assoc./Energetics / Pacific Northwest Lab	This task develops a blueprint for PO's future development of a market penetration modeling tool that will improve the analysis of industrial energy efficiency policies.	75	75	100
Comparative Study of Greenhouse Gas Emission Reduction Policies	Pacific Northwest Lab	A major technical report to Congress which satisfies the statutory requirements and contributes to the identification of policy options for further reducing greenhouse gas emissions which may warrant further analysis.	40	0	
Methodology for Assessing Impacts of Voluntary programs	Jack Faucett & Assoc.	This project was developed in anticipation of the availability of new data on the performance of voluntary programs operated by the Department and elsewhere. The framework is intended to be able to use this data for purposes of analyzing the potential for energy savings from such programs in the future.	50	100	100
Oil Conservation Potential	Jack Faucett & Assoc./Energetics	A reader friendly report describing opportunities to save oil through efficiency and substitution in all sectors of the economy.	19	25	
Energy Subsidies Conference and Report to Congress	Jack Faucett & Assoc./Energetics	The conference and report fulfill the objectives of Section 3015 of EPACT to study various issues related to energy subsidies and to report the results to Congress.	75	0	

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International Energy Policy					
India	Oak Ridge Nat. Lab	Fulfill Secretarial Commitments through India Action Plan; Advance Bilateral Policy, Regulatory, Sustainable Development, Trade and Investment Initiatives with India.	50	20	
China	Beta Corporation	Follow-up to the Secretary's Presidential Mission to China in February 1995 will be implemented across DOE.	50	20	.20
Africa/South Africa	Golden Field Office/Beta	South Africa follow up in the areas of Energy Sector Reform, Trade and Investment. Capacity Building and Science and Technology.	25	50	50
Secretarial Initiative/ Latin America	Burns & Roe	Develop and support a Trade Mission by the Secretary to Brazil, including: the planning, implementation, coordination, staffing, and execution of all activities required to achieve a successful mission.	0	15	
Summit of Americas	Institute of the Americas	Follow up to the Summit of the Americas energy commitments agreed to by Heads of State in December, 1994. This includes Hemispheric initiatives to promote cooperation on sustainable energy use and investment, including a Hemispheric Energy Symposium.	110	15	25

Trade/Sustainable Energy/Latin America	East West Center	Facilitate the promotion of U.S. exports between U.S. industry and their counterparts in Latin America, enhance science and technology cooperation, initiate outreach and/or exchanges between the Department and Western Hemisphere private and public sector energy organizations and institutions.	0	15	30
Trade Policy/Latin America	Caribbean/Latin American Action	Advance DOE/USG objectives in International Trade Policy Fora including NAFTA, FTAA, ECT, WTO, BIT's	0	10	30
International Private Power Finance Initiative	Coleman Research Corp./World Bank	Sponsor a series of meetings with other U.S. government agencies and industry to promote sustained private investment in environmentally sound projects in the international electric power sector through policy and regulatory reforms	127	120	
International Regulatory Reform	NARUC	Create Training Initiatives to meet needs identified by countries opening their economies to trade and investment and creating new regulatory structures	0	80	80
International Energy Market Analysis	EIA/Oak Ridge Nat. Lab	Review of changing markets for coal, gas, oil, relative to growth in energy demand throughout the global community and the policy implications for the environment policies.			160

Sustainable Development Export Promotion (China)	East-West Center	This study was initiated in order to provide vital information to the U.S. Government and U.S. private sector entities interested in increasing foreign investment in China. This study provided energy/environmental profiles on each of the individual Chinese provinces.	50		
Sustainable Development Export Promotion (India)	East-West Center	Conduct analytical studies on India's electricity sector, including prospects for policy reform and sustainable development, and opportunities for increased U.S. energy trade and investment.	50		
International Agreements Policy Management	Pacific Northwest Lab	On-going support to the development of international agreements review criteria with a view toward harmonization with DOE International Strategic Plan.	185		
Caspian Region Development	Atlantic Council	* Represent energy perspective in interagency working group on Caspian region * Promote coordination with U.S. energy firms on commercial projects to diversify oil and gas export routes * Implement U.S. policy for multiple export routes for both the first production and full field development * Participate in legal experts conference on the Caspian Sea boundary dispute * Assist in developing laws and regulations that attract foreign investment in energy sector and encourage energy efficiency	0	20	50

Operation, Support, and Management Systems	SOZA	Managing and monitoring, Unclassified Foreign Visits Program and the Visits Management System (VMS), Publication of new DOE Order and Implementation Guide on Visits by Foreign Nationals and Enhancement/Re-design of VMS	100	190	240
Science and Technology Policy					
Policy Analysis and Development	Center for Neighborhood Technologies National Fish & Wildlife Foundation	Development of innovative regulatory and non-regulatory approaches for ensuring environmental protection that are systemic, more cost-effective, and that more efficiently accomplish environmental protection efforts. Demonstration of alternatives in real world facilities and communities. Development of a research agenda which supports these activities.	100	88	50

Energy R&D Policy & Issue Analyses	Energetics, Inc.	Development of Energy R&D Policy Analyses and issue papers in support of the Secretary of Energy's Advisory Board (SEAB) Task Force on strategic energy R&D (Yergin Task Force) Products: 12 products; 1 budget Database	160	0	
	SNL, LLNL, ORNL, PNL	Analysis and development of a technology portfolio analysis framework and data sheet inputs in support of the Yergin Task Force.	25 25 25 25	0 0 0 0	
	Energetics, Inc. (95)/ R.K. Sen & Assoc. (96/97)	Research and Analysis of DOE energy technology successes in support of DOE report entitled, "Success Stories: The Energy Mission in the Marketplace" (May 95), GAO audit (April 96), and sequel report		20	50
	Clark Atlanta University (HBCU grant)	Research and Analysis of methodology for the systematic analysis of basic and applied R&D programs to identify and quantify successes and conduct case studies.	120	0	

Energy R&D Policy & Issue Analyses (cont'd)	R.K. Sen, Inc.	Research and policy analysis in support of integrating strategic planning and R&D portfolio analysis with the budget process, analyzing and implementing R&D management "Best Practices", analyzing and reducing non-lab overhead costs, analyzing alternative financing options.	0	80	50
National Laboratory Policy & Issue Analysis	R.K. Sen & Assoc.	Research and policy analysis of new mechanisms to enhance laboratory autonomy and accountability, determining the "correct pricing of laboratory services, and assessing R&D infrastructure needs and reducing costs.	0	35	85
India Peer Review & R&D Program Evaluation and Issue Analysis	Energetics, Inc. (FY 95)	Research and policy analysis on the application of peer review of research and development programs within DOE (FY 95)	25	0	
	R. K. Sen & Assoc.	Research, analysis and development of "best practices" for evaluating R&D programs in compliance with GPRA, CFO Act, metrics (FY 96), & implement (FY 97).	0	10	30

Foreign Participation in R&D -	Energetics, Inc. Jupiter, Inc.	Support of public hearings concerning DOE rulemaking implementing Energy Policy Act of 1992 Section 2306 on "Limits on R&D Participation by companies." Product: 10CFR part 600 (Docket No. PO-RM-95-101) "Financing Assistance Rules: Eligibility Determination for certain financing assistance programs - general statement of policy"	50	0	
	R.K. Sen & Assoc.	Policy analyses supporting development of new policy proposals, separate from statutory requirements and development of policy recommendations on expanded use of U.S. leverage in bilateral and multilateral S&T agreements (FY 96), with implementation (FY 97)	0	10	20

Environmental Technology Policy & Strategy Development	Jupiter, Inc. Oak Ridge Nat. Lab Argonne Nat. Lab	Research and policy analyses in support of DOE's contributions to the Administration's National Environmental Technology Strategy and related products, including: White House conference on Environmental Technologies (12/94), administration report, "Bridge to a Sustainable Future: National Environmental Technology Strategy" (4/95), and cd-rom, "Bridge to a Sustainable Future", describing federal programs, strategies and technologies. (10/95)	65 5 5	0 0 0	
	R.K. Sen & Assoc., Inc.	Research and policy analysis support of implementation plans supporting the National Environmental Technology Strategy and related initiatives.	0	38	68

Technology Policy					
Manage DOE S&T Process-White House NSTC	OSTI/Sandia Nat. Lab	Manage activities for the Deputy/Under Secretary to coordinate DOE-wide participation in White House Office of Science and Technology Policy (OSTP) initiative designed to establish national policies and priorities for Federal S&T programs. The processes that Policy established and now manage include the DOE-NSTC Secretariat, the DOE-NSTC Coordinating Committee, and the DOE-NSTC Laboratory Coordinating Team, which together provide a mechanism for coordinating Departmental input to the NSTC and specific committees. Specific deliverables requiring input from the Department are the Committee Annual Strategic Plans and reports, the annual OSTP/OMB Budget Priorities Guidance, the Committee-specific cross-cut reviews and sponsored National Academy of Sciences fora and reports, and the President s Report to the Congress on S&T. Contract funds provide for DOE s Office of Scientific and Technical Information (OSTI) maintenance of list servers which support each Committee area and provide instantaneous policy coordination across the department, including all DOE program offices, field/operations offices and laboratories. Support services contract support funds maintenance of a DOE library of NSTC information	150	22	25

NSTC Initiatives	Oak Ridge National Lab	Represent the Assistant Secretary for Policy on two NSTC Committees - 1) the Committee on Environment and Natural Resources (CENR), and 2) the Transportation Committee. Policy staff have launched several initiatives with these interagency groups and with the support of Office of Science and Technology Policy (OSTP) White House Staff and expect to expand these efforts during FY1996. Additionally, serve as integrators of Departmental positions and inputs on various documents, materials, and policy positions prepared by these groups, and corresponding subcommittees	10	10	5
DOE S&T Strategy	Sandia National Lab	Lead effort to develop a DOE-wide S&T forecast and strategy which links national S&T priorities with DOE priorities, Strategic Plan, & Performance Agreement with the President. The Policy Office will complete a survey of national/S&T priorities started in FY 1995 and develop and National/DOE S&T forecast. Additional activities include: development of DOE S&T Strategy (if approved to proceed), coordinating DOE input to the National Space Policy development and preparation of various sections for the President s Annual Space Report.	25	35	30

Analysis on Investments in S&T	Batelle Pacific Northwest Lab	In support of R&D Council, expand initial scoping studies begun in 1995 to evaluate and formulate policy recommendations for increasing the payoff of departmental, national and international investments in S&T. Analyze and develop a policy strategy for dealing with soft-science issues that limit hard-science payoff. Analyze recent industry and international trends for increasing productivity and competitiveness from R&D programs. Compile applicable lessons learned to aid in formulating public sector policies and improving the design and use of information gained from private and public sector R&D. Finally, apply lessons learned to DOE s effort to implement the Galvin task Force recommendation to integrate basic and applied environmental research across the Offices of Energy Research (ER) and Environmental management (EM) as part of a new initiative launched by ER-1 and EM-1.	0	50	100
DOE R&D Tracking Database System	OSTI	DOE-wide Research and Development (R&D) Tracking Database System and associated data collection, maintenance and distribution process. The System will enable the Department to respond quickly and accurately to internal and external (e.g., White House, Congress, National Science Foundation) data calls as well as provide a corporate decision-management tool for planning, programming, budgeting and evaluating DOE R&D activities.	150	50	75

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Systems Dynamics for Policy and Decision Making	Idaho Operations Office	The Policy Office and the Department do not have a common, systems approach for addressing complex policy and program direction issues. Systems dynamics uses a conceptual framework that considers all facets of the environment and their inter-relationships and measures the system response to varying input parameters. It differs from systems analysis which typically assesses alternatives to a given problem with stated criteria.	0	23	75
Energy Exports					
China JCCT	PETC (Pittsburgh Energy Tech. Center)	The U.S. and China have established a Joint Commission on Commerce and Technology (JCCT) as a forum to advance commercial interests. The DOE chairs the Energy Subcommittee which will hold its second meeting in June, 96. At the first meeting, SPC briefed DOE on the status of major power projects involving U.S. companies.	0	10	
Amman Summit-Peace Process	Beta Corp.	In response to the requests of the Governments involved in the Middle East Peace Accord - The United States, Jordan, Israel, Egypt, and Palestine - design and implement an energy undertaking to assist U.S. companies become commercial partners in various energy opportunities in the region	0	25	

Latin America Purchasing Mission	BETA Corp.	The Latin American Purchasing Agents Conference will bring together purchasing agents from the Latin American hydrocarbons industry and sales representatives from the U.S. oil and gas industry to discuss possible trade opportunities. The potential for U.S. sales of goods and services to the Latin American oil and gas industry is estimated to be $1 billion dollars by the year 2000. The conference would be held in Houston and will provide U.S. vendors of oil and gas related goods and services the opportunity to discuss the privatization and expansion efforts of Latin America's growing hydrocarbons industry. The conference will serve to introduce U.S. energy firms to these opportunities and others, provide them with a platform to discuss and demonstrate U.S. technology, increase their knowledge of the region, and make direct contact with Latin American equipment purchasers for the industry.	0	15	
Russian Electric T&D Mission	Oak Ridge Nat. Lab/PETC	Co-sponsored by the Regional Governor of Niznenovragrad, a leading proponent of privatization, a mission including U.S. transmission and distribution companies in support of the privatization effort. U.S. T&D companies have had some initial success, although Siemens - a major foreign competitor - is aggressively marketing	120	50	

U.S.-Japan Utility Sales	PETC	In cooperation with US and Japanese utilities, identify barriers to increasing Japanese utility purchases of US technology and equipment and implementing initial steps to remove them	0	10	
Eastern Europe Power Conference	PETC	This annual conference, which brings together U.S. technology companies and Eastern European Counterparts is the fourth in a series. It is always oversubscribed. The next conference will be held in Sofia, Bulgaria.	100	25	25
Philippine Trade Promotion	PETC	A small team of U.S. private sector electric power technology experts will visit the Philippines to study the Philippine electric power market. The team will identify key factors affecting competitiveness in the market, develop a list of pending projects suitable for interagency advocacy, develop a list of opportunities for U.S. companies, and develop recommendations for a government-industry partnership to increase commercial success. The mission members will prepare a report, incorporating the recommendations, that will be widely distributed to U.S. industry and government officials. The U.S. Department of Energy, U.S. Department of Commerce, and other relevant U.S. agencies in the Trade Promotion Coordinating Committee (TPCC) will work with the team to implement report recommendations	0	10	

Indonesian Clean Coal Mission	PETC	As part of U.S. Government initiatives, DOE has agreed to lead a mission involving U.S. companies to promote private and publicly owned clean coal technologies	0	10	
U.S.-Gazprom Follow-up	Oak Ridge National Lab	This project will further efforts of the U.S.-Russia Gazprom Working Group, co-chaired by the DOE since 1992. Activities include: conduct Working Group meetings; follow-up on 11 priority projects; and follow up opportunities created by the fall Conference and Roundtable with Gazprom.	60	15	
Nuclear Cleanup/Toxic Technologies	Sandia National Lab	In an effort to provide export assistance to a major sector of technologies which have been developed in conjunction with DOE, the Office of Energy Exports will conduct a study to assess potential markets for nuclear waste clean-up technologies and to identify market opportunities and barriers	0	25	
India/Pakistan Cogeneration	PETC	This project builds on the visit of the Secretary to India and Pakistan. It will provide officials in those countries with a tool they can use to support their electric power development programs in a cost effective way and will support U.S. environmental objectives. This project will be co-sponsored by the Department of Commerce.	0	5	

Energy Attache Training Program	Petroleum Equipment Suppliers' Association	The Department of Energy, Department of State, and the Petroleum Equipment Suppliers' Association will jointly sponsor the fourth annual Energy Attache Training program. This program will assist the State Department employees working at American Embassies in foreign countries with energy responsibilities to learn about the available U.S. oil and gas technologies. By assisting these employees become more familiar with available U.S. technologies, they will be able to serve industry better by developing more effective export promotion programs.	15	15	15
Israel/Trade and Development	Beta Corporation	In response to the Israel Electric Corporation (IEC) desire to increase utilization of U.S. products, the U.S. Government has committed to increase U.S. companies awareness of opportunities in Israel. In order to facilitate the entry of U.S. companies into the Israel electricity market, the Office of Energy Exports will coordinate technically-focused discussions between the IEC and U.S. companies.	0	5	

Project Matrix Management	Oak Ridge Nat. Lab	This effort builds on commitments stemming from previous Secretary and Deputy Secretary trade missions to India, Pakistan, China, South Africa, and Mexico to advocate for and track private sector business agreements. The primary focus of this activity is to continue the effort of the Oak Ridge National Laboratory in developing a business agreements tracking database system, and assist in conducting a feasibility study for a DOE-wide advocacy structure.	0	10	25
Romania ESCOS	PETC	This project, which will be co-sponsored by the Department of Commerce, will follow up on the electric power conference held in Bucharest last April. It will provide creative ideas for Romanian officials to finance upgrade in power facilities to increase efficiency and moderate environmental problems.	0	5	
Romanian Oil and Gas Mission	PETC	This project, implemented in February, 96, was a follow up to the DOE visit to Romania in April 1995 and talks with Romanian oil and gas officials. It complements a Trade And Development Agency effort to define opportunities in the market and introduced U.S. firms to these opportunities.	0	5	

Korean Environmental Conference	PETC	In an effort to provide export assistance to a major sector of technologies which have been developed in conjunction with DOE, the Office of Energy Exports will conduct a study to assess potential markets for nuclear waste clean-up technologies and to identify market opportunities and barriers.	0	25	
National Security Policy Strategic Business Plans	BCS, Inc	Develop a long-term strategic plan for selected defense sites and facilities.. This project will examine the major thematic missions and alternative futures that contribute to national security goals of the Department of Energy. This effort will utilize data developed for other DOE studies, published data, site visits and surveys and will include such sites as Y-12 at Oak Ridge, Kansas City, Savannah River Site and Pantex.	0	40	
National Security Policy Analysis	BCS, Inc.	This project provides an analytic basis for national security policy decisions. Specific issues of focus for this project include domestic and foreign nuclear preparedness; international energy security issues; international cooperation, such as the effects of placing additional U.S. fissile materials under international safeguards; and assessment of selected foreign countries institutional, economic and security postures and policies. This project will synthesize major U.S. policy and energy analyses and data from several departments and agencies, including material from State, AID, OECD, IEA, other Policy Offices, EIA and other organizations.	60	63	73

Spent Fuel Analysis	Idaho Operations Office	This project will document and analyze foreign spent fuel policies and practices. It will examine infrastructures, disposition pathways, technology options, and institutional and sectoral constraints. The purpose of the project is to determine the scope of any existing spent fuel economy (including plutonium), identifying associated national security and environmental policy issues, and preparing recommendations. Initial topics of interest are civilian, utility and research reactor uses in Russia and the Newly Independent States.	0	25	50
Environmental Security Analysis	Sandia National Lab/Batelle Pacific Northwest Lab	This effort will examine a wide range of environmental issues affecting foreign and domestic national security. It will bring to bear the physical and intellectual assets of DOE on environmental issues arising from such activities as defense complex conversions, nuclear and chemical weapons production and dismantlement, development of sustainable growth, and decommission and dismantlement of nuclear reactors used for defense purposes and will include analysis of transboundary effects in selected regions. This is a cooperative effort with NN, which will utilize the Center for Cooperative Monitoring at the Sandia National Laboratory as a major resource. The analysis will address issues of interest to the Departments of Defense and State, the Environmental Protection Agency, the Arms Control and Disarmament Agency, and the Central Intelligence Agency.	0	50	150

Nuclear Waste Mgt./Disarmament	Idaho Operations Office	This project will provide analysis of nuclear waste management programs, objectives and plans from the corporate perspective, specifically regarding: -- Possible implications of disarmament objectives for waste management goals reflected by current and proposed treaties (such as, the Comprehensive Test Ban Treaty and Pu Cut-off); -- Alternative DOE actions and their implications for U.S. policy, budgets, program design and organization, and -- Test site characterization, monitoring and requirements for U.S. and foreign governments.	0	100	100
Analytical Support for National Security Policy activities	ORISE	Analytical/Technical support was provided for national security issues associated with conversion activities and socio-economic issues.	70		
Technical Support to IAEA activities	ORISE	Technical and analytical support to IAEA activities and fissile material inspections and verifications.	100		
Energy Security Policy Petroleum Supply System Vulnerability Assessment	Mathtech, Inc.	Evaluate the energy and national security implications of the vulnerabilities of the petroleum supply systems including pipelines, refineries and tankers; in particular, potential for inadequate capacity to meet fuel requirements during national emergencies.	50	150	150

Natural Gas Supply System Vulnerability Assessment	SAIC	Develop a model to assess the reliability of the natural gas flows under various emergency conditions such as pipeline outages and severe weather conditions.	0	25	75
Electric Power Reliability Assessment	Gama Corporation	Assemble Federal, State, and industry stakeholders and conduct a table-top exercise to examine the reliability risks in the new, restructured electric utility industry.	0	50	
Economic Impacts of Oil Price Shocks	Oak Ridge Nat. Lab	Investigates routes by which oil price shocks affect the U.S. economy and distinguish the effects in the recent past of oil price shocks from those of macroeconomic policy. Two research grants were made to carry out the project: one to the University of Chicago; and one to the University of California at San Diego and Dartmouth College.	50	135	50
Global Energy Security Analysis	Cambridge Energy Research Association	Monitor, detect problem spots and evaluate risks in the global energy supply systems, in parallel to the same activities currently being carried on the domestic side. The work will be carried out in close coordination with DOE's Offices of Intelligence and International Affairs.	0	50	50

Environmental Management Policy					
Asset Management Program	Department of Commerce	Establish an Asset Management Program to effect a reduction of materials under DOE care and reduce overhead and custodial costs at the DOE laboratories and facilities, and to effect a paradigm shift within DOE and contractors operations to better manage assets and conserve resources.	0	177	300
DOE Mass Balance Inventory	Coleman Research Corp./Oak Ridge National Lab	Development of Department-wide mass balance inventory of all material assets, waste and nonwaste, radioactive and nonradioactive that is currently stored or used.	125		
Int./Ext. ES&H Regulations	ORSI	Development of a Departmental ES&H policy that integrates and consolidates regulation of DOE sites and facilities.	40		

Environmental Restoration	EMR	This effort will examine a wide range of environmental issues affecting foreign and domestic national security. It will bring to bear the physical and intellectual assets of DOE on environmental issues arising from such activities as defense complex conversions, nuclear and chemical weapons production and dismantlement, development of sustainable growth, and decommission and dismantlement of nuclear reactors used for defense purposes and will include analysis of transboundary effects in selected regions.	0	50	0
Strategic Planning Budget and Program Evaluation					
Performance Agreement	ORISE/ Socio-Technical Research Applications, Inc.	Development and implementation of an integrated Performance for the Department containing well-defined and articulated priorities.	130	75	75
Strategic Planning	Socio-Technical Research Applications, Inc.	Management of semiannual departmental strategic planning process and the publication of the plan	330	50	200
Budget Planning and Analysis	Socio-Technical Research Applications, Inc.	Issue Analysis supporting budget formulation	190	90	90

Annual Report	Enviro-Management & Research, Inc.	Development and implementation of an integrated framework that takes a systems approach to the Department's performance management, linking planning, budgeting, execution, measurement, tracking, evaluation, and annual reporting	0	35	35
Information Systems Development	DynCorp.	Development and implementation of an integrated framework that takes a systems approach to the Department's performance management, linking planning, budgeting, execution, measurement, tracking, evaluation, and annual reporting	25	125	125
Performance Evaluation	Socio-Technical Research Applications, Inc.	Development and implementation of an integrated framework that takes a systems approach to the Department's performance management, linking planning, budgeting, execution, measurement, tracking, evaluation, and annual reporting	0	50	50
Strategic Management System	Socio-Technical Research Applications, Inc.	The development of a DOE-wide strategic management system for FY 1998 that integrates the processes of planning, quality-based budgeting, and program evaluation	25	20	25
Budget Information System (DIAS)	Socio-Technical Research Applications, Inc.	Internal communication of program planning and budget-related information	0	73	73
Policy Office Planning and Budget	Socio-Technical Research Applications, Inc.	Lead the Policy Office planning and management process including strategic planning, annual goals and measures, and operational reviews	150	25	100

Office of Resource Management					
Blanket Purchase Agreements	Graham, Inc. NAI Temp. Corp. Star Temps Best Temps Nat'l Associates	Management of proposed contracts with temporary private sector secretarial services for emergency use only.	60	16	20
Security Support	Lockheed-Martin Energy Systems	Management of annual Security Support Contract	300	75	70
Information Management System	Enviro-Management & Research, Inc. (EMR)	Provide database development, document production and control. (Executive Secretariat)	400	125	150
Policy Office Budget Formulation & Projects	CDSI	System for maintaining Annual Operating Plan's throughout the year with periodic reports which supports PO budget justification for Internal DOE, OMB, and Congressional submissions.	20	25	25
			$9,575,000	$6,900,000	$8,421,000

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OFFICE OF POLICY

Mr. Myers. How much was spent on foreign travel within the Department, including contractors, fiscal years 1994 and 1995?

Mr. Vivona. The Department does not maintain detailed accounting records that differentiate between international and domestic travel. Based upon international travel requests, and excluding international travel by Naval Reactors and the Office of the Secretary (who are handled outside the system) and excluding all travel by the Department to Canada and Mexico, the Department estimates that Federal and contractor employees spent $27,368,000 in fiscal year 1994 and $28,331,000 in 1995.

Mr. Myers. Provide brief synopsis of major energy development programs outside the United States. What are the comparable spending levels with DOE Programs?

Mr. Reicher. Data on member government energy R&D budgets are available, with a time lag, from the International Energy Agency (IEA). The latest data available are for 1994, with data for 1995 becoming available in June.

In absolute terms, the Japanese government spends almost twice as much on energy R&D as does the U.S. government, but the U.S. and Japan each spend far more than other IEA countries on energy R&D, and together they account for nearly 75% of all IEA member countries' energy R&D expenditures.

In relative terms, however, eight countries spend more government funds than the United States on energy R&D per unit of Gross Domestic Product (GDP): Japan, Switzerland, the Netherlands, Norway, France, Canada, Sweden and Italy. If nuclear research is excluded, only five countries spend more on energy R&D relative to GDP than the United States.

The United States spends more than any other IEA member country in energy R&D in the areas of energy efficiency, oil and gas, renewable energy, and energy systems and analysis. Japan spends more than any other IEA member country in the areas of coal, electricity, nuclear fission and fusion, and is second to the United States in the areas of energy efficiency, oil and gas, renewables, and energy systems and analysis.

The latest data on IEA member country expenditures for energy R&D by category are included in a recently issued publication by the IEA and will be provided to the Committee by separate cover.

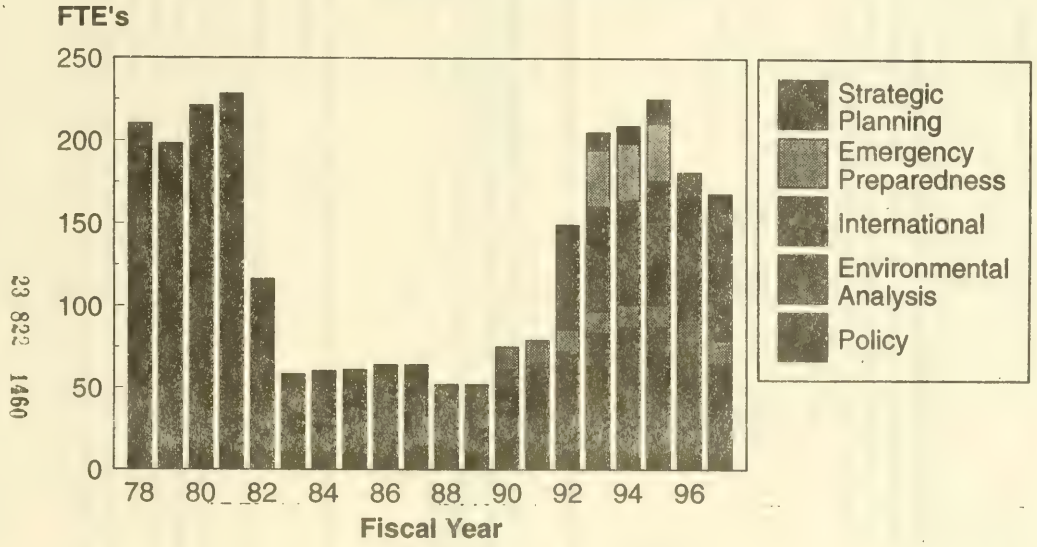
Mr. M yers. Why does the Department need a central policy staff of 172 employees when each program organization has its own policy staff?

Mr. Reicher. The Office of Policy takes responsibility for policy analysis, international affairs, and strategic planning. These and similar functions are often performed by separate entities in other Federal agencies. In all, the Department of Energy's commitment of staffing resources to these activities is substantially less than at many of these agencies. The Office of Policy provides the Department with the capability to examine complex issues and policies that cut across the Department's missions and beyond the purview of any one program area. Through this integrated analysis, the Policy Office provides to the Secretary independent perspectives and advice that otherwise might not be considered. The Policy Office also utilizes resources from across the Department to ensure that Presidential initiatives (such as the Climate Change Action Plan), Congressional commitments (such as the Energy Policy Act and the Government Performance and Results Act), and Secretarial priorities (such as the Strategic Plan and the Galvin and Yergin Task Force assessments) are carried out as effectively and efficiently as possible.

A year ago, the Office of Policy had 227 employees on board. By the end of this fiscal year, the number will be 181, down by considerably more than the 15 percent reduction mandated

in the FY 1996 Appropriations language. Our FY 1997 budget proposes to further reduce Office of Policy staff to 172 employees. I have attached a chart showing the historical staffing levels by function.

Policy Office Staffing by Function



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OIL IMPORTS

Mr. Myers. Please provide the amounts of oil imports into the United States for each year since 1978.

Mr. Hakes. The net amounts of crude oil and petroleum products imported into the United States since 1978, in million barrels per day, are as follows:

1978	8.00	1987	5.91
1979	7.99	1988	6.59
1980	6.36	1989	7.20
1981	5.40	1990	7.16
1982	4.30	1991	6.63
1983	4.31	1992	6.94
1984	4.72	1993	7.62
1985	4.29	1994	8.05
1986	5.44	1995	7.88

Mr. Myers. What is the forecast for U.S. oil imports for the year 2000 and 2020?

Mr. Hakes. The net amount of crude oil and petroleum products expected to be imported into the United States is 10.08 million barrels per day in 2000 and 11.79 million barrels per day in 2015, as presented in our *Annual Energy Outlook 1996*. We currently do not have import projections for the year 2020.

DISTRIBUTION OF FTES WITHIN THE OFFICE OF CONGRESSIONAL, PUBLIC, AND INTERGOVERNMENTAL AFFAIRS

Mr. Myers. How many FTEs are assigned to each of the main mission areas in fiscal years 1995, 1996, and 1997?

Mr. Forrister. The following table provides the breakout of FTEs for the Office of Congressional, Public, and Intergovernmental Affairs. In addition to program liaisons, the congressional activity includes the hearings coordination staff and the offices of the Deputy Assistant Secretaries for House and Senate Liaison, which primarily work with the Principal Secretarial Officers.

	FY 1995	FY 1996	FY 1997
Management & Planning (Program Direction)	23	20	17
Congressional	35	34	31
Liaison Staff	(20)	(19)	(16)
Hearings Coordination	(7)	(7)	(7)
Deputy Assistant Secretaries/House & Senate	(4)	(4)	(4)
Management & Support Staff	(4)	(4)	(4)
Press Office	20	20	18
Internal Communications	9	8	8
Intergovernmental/Consumer & Public Liaison	17	16	13
Research (Legislative/States)	14	12	12
Total	118	110	99

Mr. Myers. Please identify how many employees in each office are assigned as liaison to each DOE program organization.

Mr. Forrister. Our liaison staff is aligned to fit into matrix teams that correspond to the five business lines of the Department The matrix teams draw upon personnel in our congressional, press, and intergovernmental units to provide comprehensive support to program offices. The assignments, as shown below for the record, are not static; they change frequently as staff is reassigned on any given day to support program initiatives. In addition to matrixed program support, the liaisons identified here also provide regular interface with external customers, including the Congress, State, and local elected officials, Native American Tribes, media, representatives of the energy, environment, business, and consumer communities, and the general public. The liaison numbers exclude program direction and clerical support.

	FY 1995			FY 1996			FY 1997		
	Cong'l	Press	Intergov'tl/ Consumer/ Public	Cong'l	Press	Intergov'tl/ Consumer/ Public	Cong'l	Press	Intergov'tl/ Consumer/ Public
National Security	3	3	1.5	3	3	1	3	2	1
Environm'l Quality*	5	3	2.5	5	3	2	5	4	2
Energy Resources	6	4	1.5	5	4	2	4	3	2
Science & Technology	3	2	1.5	3	2	1	2	2	1
Departmental Programs	3	4	2	3	2	3	2	2	3

*Includes the Deputy Director

DISTRIBUTION OF PUBLIC AFFAIRS CONTRACTOR STAFF OUTSIDE WASHINGTON DC

Mr. Myers. What is the size of the public affairs office maintained by site by each DOE contractor? Provide total for each site. (In your analysis, please describe what criteria are used by each contractor to define the public affairs function to ensure that the information from each contractor is compatible.)

Mr. Forrister. We have queried our DOE contractors at our sites to determine the number of people that support public affairs activities. Each contractor has unique responsibilities and therefore some offices' activities and functions are more diverse than others. The numbers, along with the specific functions reported for these offices are included in the chart provided for the record. The information follows:

Albuquerque Operations Office (Total 78)

Los Alamos National Laboratory, NM (Univ. of Calif.)
- 5 Media relations

Sandia National Laboratories, NM, and Calif. (Lockheed Martin Corp.)
- 1 Manager
- 5 Media Relations
- 2 Public Relations at Sandia National Lab./Calif.
- 4 Community Relations
- 4 Community Involvement/Issues Management

Pantex
- 1 Director
- 1 Secretary
- 1 Media relations
- 1 Internal communication
- 1 Public involvement
- 1 Education liaison
- 2 Statewide Environmental Impact Statement support

Pinellas Plant
- 2 Manager and coordinator
- 2 Customer service relations and receptionist
- 2 Education, media, community, tours/visitors
- 1 Environmental/community relations, public participation

Waste Isolation Pilot Plant (Westinghouse Corporation)
- 2 Department Manager and secretary
- 1 Switchboard & receptionist services for the entire Carlsbad Area Office, at the request of the DOE
- 1 Analyst assesses the needs and provision of external communications

Albuquerque Operations Office (cont'd)

Waste Isolation Pilot Plant (Westinghouse Corporation) (cont'd)

3 Media relations and public information products. This work includes generating and distributing news releases, handling inquiries from the news media, coordinating site tours for members of the news media, and publishing written products intended to inform the news media and the general public about the project.

7 Facility tours for the general public, speakers bureau, educational outreach, community relations, and exhibits

2 Handle inquiries coming in from the public (project's toll-free number)

7 Satisfy requirements spelled out in the WIPP Land Withdrawal Act and cooperative agreements between the DOE and state (New Mexico, Western Governors' Assoc., Southern States Energy Board) and tribal; governments. The requirements address issues such as emergency preparedness and transportation safety.

1 Radiological Assistance Program support for the Federal Radiological Emergency Response Plan as required by the Atomic Energy Act of '54.

1 Video productions for the entire WIPP site

6 Graphic arts and photographic services for the entire WIPP site.

3 Administrative/clerical support to the various functions within the department.

Grand Junction

4 Education, advisory board, speakers' bureau, emergency public affairs, (RUST Geotech, Inc.) media relations, community relations, and internal communication

Uranium Mill Tailings Project, NM (Jacobs Engineering)

1 Manager

1 Secretary

2 Stakeholder relations for 24 sites in 10 states; employee relations, community relations, and media relations

Chicago Operations Office (Total 48)

Ames Laboratory

1 Manager/Media Relations

2 Internal Publications

1 Tours, Community Relations

2 Clerical

Argonne National Laboratory

1 Director

3 Public Information

Chicago Operations Office (cont'd)

Argonne National Laboratory (cont'd)

3 Employee Communications
4 Community Relations/Education
1 Publications
1 Management Communications/Speechwriting
4 Administrative

Brookhaven National Laboratory

1 Director
6 Internal and External Relations
5 Tours, Museum, Science Education
1 Clerical

Fermi National Accelerator Laboratory

1 Director
2 Writer/Editors
1 Clerical

National Renewable Energy Laboratory (NREL)

1 Manager/Community Relations
2 Media Relations, Public Inquiries
1 Visitor/tour programs
2 Internal and external publication editors
1 Public participation

Princeton Plasma Physics Laboratory

1 Director/Public Affairs Officer

Golden Field Office (Total 1)

1 Support Service Contractor (includes support in the following areas: writing, internal, community, academic programs, and FOIA

Idaho Operations Office (Total 28)

Idaho National Engineering Laboratory (INEL)

1 Director
7 Manager, media relations, employee communications
11 Manager, community relations, emergency preparedness, INEL speakers bureau, tours
5 Manager, Boise outreach office, outreach coordinator, secretary
4 Manager, special events/video, writer, secretary

DISTRIBUTION OF PUBLIC AFFAIRS CONTRACTOR STAFF OUTSIDE WASHINGTON DC (cont'd)

Nevada Operations Office (Total 46)

2 Manager and Secretary
2 Tour Coordination
3 Employee Communications
2 Business Development Communications
1 Community and Media Relations
1 Educational Outreach
1 Graphic Artist

Yucca Mountain Project Office

5 Manager and Administrative/Budget Support
2 Manager and Secretary for Intergovernmental Programs
1 Media Relations
2 Community Relations
1 Stakeholder Relations
1 Manager for Outreach Programs
4 Visitor Centers - 3 facilities
1 Product Distribution Warehouse
4 Public Information Response
1 Educational Programs
3 Speakers Bureau and Tour Programs
2 Manager and Administrative Support for Product Development
4 Publication Writers/Editors
3 Graphics and Photo Support

Oak Ridge Operations Office (Total 55)

Bechtel National, Inc.

1 Director
1 Secretary
3 Public Involvement/Media Relations

Enterprise Advisory Services Inc. (American Museum of Science and Energy)

1 Director

Jacobs Engineering (Weldon Spring Site Remedial Action Project)

1 Director
3 Public Involvement

Oak Ridge Operations Office (Total 55)

Lockheed Martin Energy Systems* (M&O for Oak Ridge National Laboratory, Y-12 Plant, K-25 Site, & environmental restoration program at Paducah, Kentucky, and Portsmouth, Ohio)

1 Director
5 Secretarial (at five locations in Tennessee, Kentucky and Ohio
8 General Public Affairs/Media Relations (at three Oak Ridge sites)
4 Employee Communications
11 Public Involvement (at three sites in Tennessee, Kentucky, & Ohio)
*In Early December, new contract is expected to be signed with Lockheed Martin Energy Research (a new company) for operation of Oak Ridge National Laboratory. When this contract becomes effective in early January, 6 positions (5 public affairs/media relations and 1 secretary) will transfer to the new company.

Oak Ridge Associated Universities (Oak Ridge Institute of Science & Education)

1 Director
1 Secretary
2 Technical Information
6 Graphics/Presentations
3 General Public Affairs/Media Relations/Employee Communications

Southeastern Universities Research Associates (Continuous Electron Beam Accelerator Facility (CEBAF), Newport News, VA)

1 Director
1 Secretary
1 General Public Affairs, Media Relations

Oakland Operations Office (Total 26)

Energy Technology Engineering Center (ETEC)

1 Communications

Lawrence Berkeley National Laboratory (LBNL)

2 Director and Secretary
2 Employee Communications
2 External Communications
2 Community Relations

Lawrence Livermore National Laboratory (LLNL)

2 Community Relations
1 Environmental Communications
5 Employee Communications
4 Media Relations
1 Protocol Support

Oakland Operations Office (cont'd)

Stanford Linear Accelerator Center (SLAC)
- 2 Community Outreach, Media and Public Affairs
- 2 Tour Program

Ohio Field Office (Total 24)

Ashtabula
- 1 Media Relations at Reynolds Metal Inc Decommissioning Project (RMI)

Fernald
- 2 Managers
- 3 Senior Public Affairs Specialist
- 2 Public Affairs Specialist
- 2 Secretary
- 1 Administrative Assistant

Mound
- 2 Public Affairs/Media Relations/Internal Communications

West Valley New York
- 1 Community Relations Manager
- 2 Community Relations Specialist
- 1 Community and Environmental Affairs Specialist
- 1 Lead Technical Writer
- 1 Secretary

Richland Operations Office (Total 44.75)

Bechtel
- 2 Media relations, employee communications, management
- 1 Public involvement
- .25 Hanford Environmental Health Foundation

Kaiser
- 1 Media Relations

Pacific Northwest National Lab
- 6 Lab-level, including internal and external communications
- 9 Direct Project Support

Westinghouse --Dir. Office
- 1 Director
- 1 Executive Secretary
- 1 Staff Manager
- 1 Tech Communications

--Employee Communications:
- 1 Manager
- 1 Secretary
- 4 Staff (Includes REACH, DOE This Month, JIC, Management Network, Employee Messages

Richland Operations Office (cont'd)

Westinghouse (cont'd)

--Project Communications:

1 Team Leader
1 Secretary
1 Tours Coordinator
1.5 Speakers Bureau, Publications, Newsclips
5 Program and Media Communications

--Public Involvement:

1 Team Leader
1 Secretary
4 Public Involvement Specialists

Savannah River Operations Office (Total 45)

2 Savannah River Ecology Laboratory
2 Wackenhut Services, Inc.
2 U.S. Forest Service

Westinghouse

7 Media Relations
12 Video/photo support
10 Community Outreach, public involvement, emergency response
10 Internal Communications

DISTRIBUTION OF PUBLIC AFFAIRS FEDERAL STAFF WITHIN AND OUTSIDE OF WASHINGTON DC

Mr. Myers. What is the size of the public affairs office maintained by each DOE operations, field, area, site or support office outside of Washington? Do not consolidate by major office, but include each individual office.

Mr. Forrister. Public affairs staffing levels in DOE Headquarters and Field offices are shown in a chart which I would like to provide for the record. Since each Field office has very diverse missions and functions, their staffing levels include public affairs staff required to accomplish the mission of that particular office. Some offices include personnel that have responsibilities ranging from Freedom of Information Act inquiries, public and audiovisual review and approval, as well as declassification of technical information and technical library documents in addition to the basic public affairs activities of working with the news media. It is important that we continue to provide information to the public that will foster an understanding of our activities as we change our mission, streamline, and achieve budget reductions set forth in the Secretary's Strategic Alignment Initiatives. The information follows:

Albuquerque Operations Office (Total 11)

1 Director
1 Secretary
1 Indian Affairs
1 Protocol, Internet policies, primary research, individual state Agreements-in-Principle
1 Crisis communication, Public Affairs plans, regulations, orders and reports, Quality Strategic Plan support, media training, Manager's and Public Affairs' weekly reports
1 Biographies, fact sheets, speechwriting, "best practices" (case study) research
1 Media relations/Congressional affairs/intergovernmental affairs
1 Employee communications (print and audiovisual), "All Hands" employee meetings, video conferencing and satellite links
1 Public Affairs budgets, training, awards, contractor audiovisual and publications approvals
1 Public participation, stakeholder involvement
1 Community relations, exhibits, speakers' bureau, educational outreach, environmental justice, special briefings

Waste Isolation Pilot Plant (Westinghouse Corporation), Carlsbad, NM (Total 3)

1 Team Leader
1 External Affairs
1 Stakeholder Relations

Chicago Operations Office (Total 5)

1 Director/Public Affairs Officer
3 Public Affairs Specialists:
Media/Public Participation
External Affairs/Public Participation
Internal/General Public Affairs
1 Clerical

Golden Field Office (Total 1)

1 DOE Director (includes media, community, congressional, tribal liaison, FOIA, and academic programs)

Idaho Operations Office (Total 9)

1 Director
1 Internal Information/Publications and audio/visual approvals
1 Tribal Liaison
2 (.3) Congressional Liaison and (1.7) Academic Programs
1 Public Participation/economic development
1 Media relations/speech writer/emergency communications
2 FOIA/class/declass info/tech information and technical library

Nevada Operations Office (Total 9)

1 Director
4 Public Affairs Specialists
1 Public Affairs Trainee (Student)

Yucca Mountain

1 Director
1 Media Relations
1 Community Relations

Oak Ridge Operations Office (Total 6)

1 Director
1 Secretary
2 Employee Communications
1 Media Relations/Emergency Public Communications
1 Public Involvement

Oakland Operations Office (Total 7)

2 Director and Secretary
1 Congressional and Intergovernmental
1 Public Participation
1 Public Affairs Specialist
1 Public Reading Room Manager
1 Directives Assistant

Ohio Field Office (Total 4)
2 Staff Members

Fernald 1.5 Media Relations

Mound 1 Media Relations

Richland Operations Office (Total 8)
1 Director
1 Clerical
4 Internal, Community, Media
2 Public Involvement

Rocky Flats Field Office (Total 9)
1 Director
1 Deputy Director/Administrative
1 Media Relations
2 Community Relations
1 Foreign and International Visits
1 Tours & Visits
1 Freedom of Information Activities
1 Employee Information

Savannah River Operations Office (Total 8)
1 Director
1 Senior Public Affairs Specialist
4 Public Affairs Specialists
1 Administrative Assistant
1 Secretary

Mr. Myers. What is the size of the public affairs office at Headquarters?

Mr. Forrister. Currently there are 18 employees in the Headquarters press office within the newly created Office of Congressional, Public, and Intergovernmental Affairs. This staff has played a major role in articulating the Department's mission to the public and we feel that this activity is an essential part of building trust and understanding of the Department's programs.

PUBLIC AFFAIRS CONTRACTS FOR FY 1994, FY 1995, & FY 1996

Mr. Myers. Please identify all contracts which were initiated and signed off by the public affairs office in FY 1994, 1995, and 1996. Include the name of the contract, fiscal year funding, the budget and reporting code to which the contract was charged, and a brief description of the contract.

Mr. Forrister. Our office has identified contractual support activities that provides public affairs support for information being disseminated internally and externally to our customers. The public affairs contracts for FY 1994, FY 1995, and FY 1996 are shown in a table which I would like to insert in the record. Note, the following funding amounts reflect the original estimates on the contracts at the time they were initiated. The information follows:

CONTRACT NAME/DESCRIPTION	Amount Funded
FY 1994 - B&R LE - PUBLIC AFFAIRS	
--**Fox Temporary Service**: Temporary secretarial assistance to support a 30% increase of press releases, volume of phone calls, and written correspondence resulting from the announcement of human radiation experimentation projects.	$11,202
--**U.S. Newswire**: Newswire transmission service of DOE news releases (01/01/92 - 12/31/93)	3,695
--**PR Newswire**: Newswire transmission service of DOE news releases (01/01/94 - 12/31/94)	9,313
--**ETUS**: Early morning delivery of newspapers and publications for newsclipping service	12,000
--**Radio/TV Reports**: Transcription services of radio and television programs, including video and audio tapes concerning energy-related issues	25,545
--**Burrelles**: Early morning electronic transmission of newsclips from newspapers, business publications and TV transcripts	26,193
--**Glenn Shriver**: Miscellaneous publications used for newsclipping service	1,019
Conference Facilities -- Field Public Affairs Directors' Meetings	230
--**American Institute of Aeronautics & Astronautics**	
--**Channel Inn Hotel**	630
--**National Seminars Group**: TQM Workshop for PA Managers	371
--**Black College Satellite**: Visual aid on Departmental initiatives/policies	1,500
--**Communication on Hostile Environment Seminar**: Workshop Materials	42
FY 1994 - B&R LD -- CONSUMER AFFAIRS	
--**CDR Communications, Inc**: Radio programs educating consumers on energy matters	$25,000
--**North American Precision**: Radio public service announcements on energy saving matters	18,000
FY 1995 - B&R LE - PUBLIC AFFAIRS	
--**PR Newswire**: Newswire transmission service of DOE news releases	$5,084
--**Radio/TV Report**: Transcription services of radio and television programs, including video and audio tapes concerning energy-related issues	18,422

CONTRACT NAME/DESCRIPTION	Amount Funded
FY 1995 - B&R LE - PUBLIC AFFAIRS (cont'd)	
--**Tyronne Bell**: Early morning delivery of newspapers & publications for newsclipping service	10,690
--**Burrelles**: Early morning electronic transmission of newsclips from newspapers, business publications and TV transcripts	25,000
--**Computer Aided Research and Media Analysis (Carma) International**: Media monitoring study	2,500
--**St. Vincent Communications Directory**: Profiles of 120 Afro/American Radio Stations	130
--**Crown Books**: TQM Materials for Quality Management & Organization Development	165
--**Highsmith**: Display Case for PA's Quality Incentive Awards	488
--**Marketing Dynamic**: Quality Incentive Materials	7,250
--**LA Mansion Del Rio (San Antonio, TX)**: Conference Facilities -- Field Public Affairs Directors' Meetings	364
--**Electronic Industries Assoc**: Publication	154
--**Georgetown Publishing House**: American Speaker Handbook	298
--**Glenn Shriver**: Miscellaneous publications used for newsclipping service	1,500
--**Aldus Pagemaker**: Macintosh Visual Guide	30
--**Pacifica Radio Archives**: Audio Discussion Tape	25
--**Expresive Logus Collection**: Research & Editorial Services Materials	80
FY 1995 - B&R LD -- CONSUMER AFFAIRS	
--**CDR Communications, Inc**: Radio programs educating consumers on energy matters	$18,981
--**Legacy**: Radio public service announcements on energy saving matters	25,000
--**Mac Zone**: Adobe Illustrator for Macintosh	387
--**Rose Advertising Specialties**: Magnet Cards for National Consumer Week	700
FY 1996 - B&R LE - PUBLIC AFFAIRS	
--**Tyronne Bell**: Early morning delivery of newspapers & publications for newsclipping service	$9,600
--**Glenn Shriver**: Miscellaneous publications used for newsclipping service	1,000
--**Radio/TV Report**: Transcription services of radio and television programs, including video and audio tapes concerning energy-related issues	10,000
--**Burrelles**: Early morning electronic transmission of newsclips from newspapers, business publications and TV transcripts	25,000
FY 1996 - B&R LD -- CONSUMER AFFAIRS	
No contracts have been obligated to date.	-0-

FUNDING THE CARMA CONTRACT

Mr. Myers. Congress appropriates funding for public affairs support activities. Why wasn't the Carma contract charged to this account?

Mr. Forrister. The Computer Aided Research and Media Analysis (Carma) International contract was considered a computer news media/article data gathering source. Funding was within the scope of the Departmental Administration Information Management budget. Funds from the Public Affairs contract account are not obligated for computer/ electronic information gathering.

BOARD OF CONTRACT APPEALS

Mr. Myers. Please provide a case load analysis of the Board of Contract Appeals for FY 1995 and FY 1996.

Judge Van Doren. In FY 1995, the dockets of the Board of Contract Appeals and its associated boards totaled 58 cases. We estimate the FY 1996 docket will be 65 cases. A breakdown of the case load is shown in a table which I would like to insert in the record. (The information follows:)

BOARD OF CONTRACT APPEALS

CASE LOAD ANALYSIS
(FY 1995 and FY 1996)

Docket No.	Case Title	Relief Sought	Contract Type	Status
216-6-82	Beacon Oil Co.	$ 1,296,937	(Sale of crude	Remanded from
345-12-83	"		(oil from NPR	Federal Circuit
C-9112116	American Industrial Contractors	$ 189,576+	Construction	Dismissed
C-9207127	Kern Oil & Refining Co.	$ 369,615	(Sale of crude (oil from NPR	Decided
C-9207128	Sunland Refining Corp.	$ 101,604	"	Decided
C-9207129	Lunday-Thagard Co.	$ 125,696	"	Decided
C-9207130	Golden West Refining Co.	$ 272,511	"	Decided
C-9208134	Golden West Refining Co.	$ 869,427	(Sale of crude	Decided
C-9208135	et al.		(oil from NPR	
C-9208136	"			
C-9208137	"			
C-9208139	The Maxima Corp.	$ 1,163,928	Services	Suspended
C-9211144	Bart Associates, Inc.	$ 1,352,542	Construction	Pending
C-9301147	Materials Engineering Associates	$ 366,358	NRC contract	Dismissed
C-9303149	Planning Research Corp.	$ 456,643	Services	Settled
C-9304150	RMI Titanium Co.	$ 27,130,000	Services	Suspended
C-9307154	Advanced Sciences	$ 781,724	Services	Settled
C-9309157	John M. Cockerham & Associates	$ 49,679	Services	Decided
C-9311158	R. A. Glancey & Sons, Inc.	unknown	Services	Dismissed
C-9311159	Simpson Contracting Corp.	$ 162,133	Services	Dismissed
C-9312161	Simpson Contracting Corp.	$ 150,662	Services	Decided
C-9312162-1	Green's Multi-Services	$ 144,615	Services	Pending

E-9312163	Bart Associates, Inc.	unknown	EAJA	Dismissed
C-9312164	Columbia Services Group	$ 344,623	Services	Suspended
C-9401165	Presley, Inc.	$ 750,836	Services	Settled
C-9401166	Polaris Travel, Inc.	$ 504,069	Services	Pending
C-9402172-1	Lamb Engineering & Construction	$ 486,104	Construction	Pending
-2				
-3				
-4				
-5				
-6				
-7				
C-9403174	Polaris Travel, Inc.	$ 6,596	Services	Pending
C-9402175	Semford Contracting Co.	$ 98,872	Services	Settled
C-9406176-1	Bart Associates, Inc.	$ 160,149	Construction	Pending
-2				
C-9408177	JOB Line Construction, Inc.	$ 480,000	Construction	Decided
M-9404178	Presley, Inc.	$ 750,836	Services	Board mediated settlement
C-9501179	Duke City Investigators	$ 256,316	Services	Settled
C-9503180	John M. Cockerham & Associates	$ 15,000*	Services	Settled
C-9503181	Head, Inc.	$ 269,353	Construction	Settled
M-9506184-1	Duke City Investigators, Inc.	$ 256,316	Services	Board mediated settlement
-2				
-3				
C-9508185	EG&G Idaho, Inc.	$ 38,431	Services	Pending
E-9508186	Simpson Contracting Corp.	$ 36,609	EAJA	Dismissed
C-9509187-1	Rockwell International Corp.	$ 10,039,511	Services	Pending
-2				
-3				
C-9601188	Industrial Contractors, Inc.	$ 644,324	Construction	Pending
R-9602189	Beacon Oil Co.	$ 1,296,937	(Sale of crude (oil from NPR	Pending

E-9602190	Simpson Contracting Corp.	$ 67,652	EAJA	Pending
M-9603191	ICF Kaiser Hanford Corp.	$ 1,400,000	Services	Pending
A-9603192	ICF Kaiser Hanford Corp.	$ 1,400,000	Services	Arbitration
C-9603193	Industrial Contractors, Inc.	$ 77,283	Construction	Pending

FINANCIAL ASSISTANCE APPEALS BOARD

CASE LOAD ANALYSIS
(FY 1995 and FY 1996)

Docket No.	Case Title	Relief Sought	Contract Type	Status
F-9207126	Auxilio Mutuo Hospital	$ 85,625	Energy conservation	Dismissed
F-9402171	D.C. Department of Housing and Community Development	$ 615,079	Weatherization assistance	Settled
F-9505182	Tamco Power Partners	$ 1,287,660	Cooperative agreement	Pending
F-9505183	Tamco Power Partners			

CONTRACT ADJUSTMENT APPEALS BOARD

CASE LOAD ANALYSIS
(FY 1995 and FY 1996)

Docket No.	Case Title	Relief Sought	Contract Type	Status
CA-9311160	Simpson Contracting Corp.	Contract reformation	Services	Dismissed

INVENTION LICENSING APPEALS BOARD

CASE LOAD ANALYSIS
(FY 1995 and FY 1996)

Docket No.	Case Title	Relief Sought	Contract Type	Status
I-9107101	Southern Pacific Transportation	Termination of partially exclusive license	N/A	Pending
I-9108112	Voluntary Purchasing Groups	Join in request to terminate above	N/A	Pending

FIELD OPERATIONS HUMAN RESOURCES AND ADMINISTRATION

Mr. Myers. Please provide an organization chart including FY1997 FTEs and funding for each element in the field management organization.

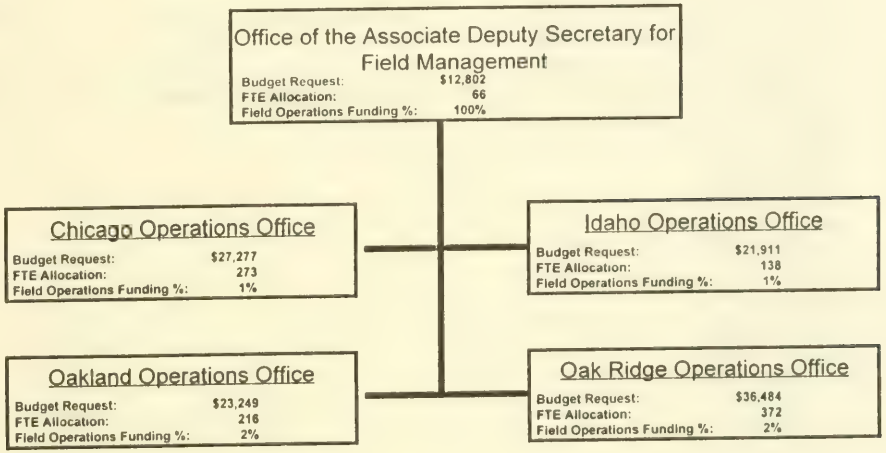
Mr. Pearman. The Field Operations account provides funding for five major elements including: full funding for the Office of the Associate Deputy Secretary for Field Management, and partial funding for Chicago Operations Office, Idaho Operations Office, Oakland Operations Office, and Oak Ridge Operations Office. I am providing overview charts, that present these elements with FY 1997 Congressional Budget Request information and FTE allocation. Lower level charts showing each element structure and related resources are also included.

Field Management Reporting Elements

FY 1997 Congressional Budget Request

Fully Funded by Field Operations (FO)

(Dollars in thousands)



Total Field Operations

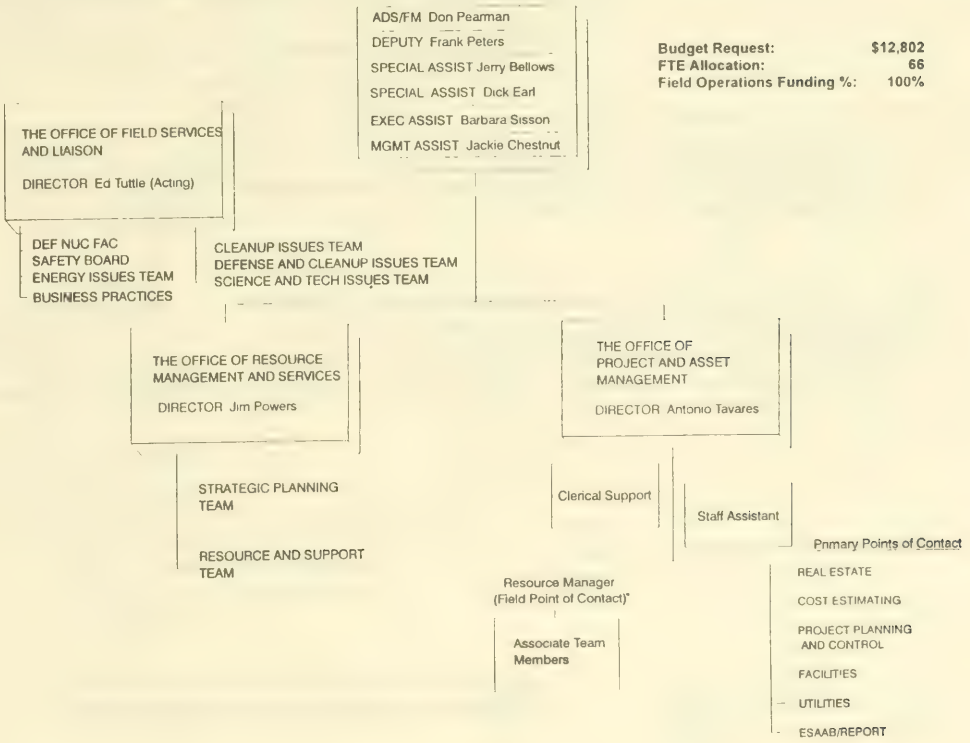
Budget Request: $121,723

FTE Allocation: 1,065

Source: Department of Energy, FY 1997 Congressional Budget Request, Energy Supply, Research and Development.

As of 4/2/1996
File Name: FM20&50.PRS

Office of the Associate Deputy Secretary for Field Management

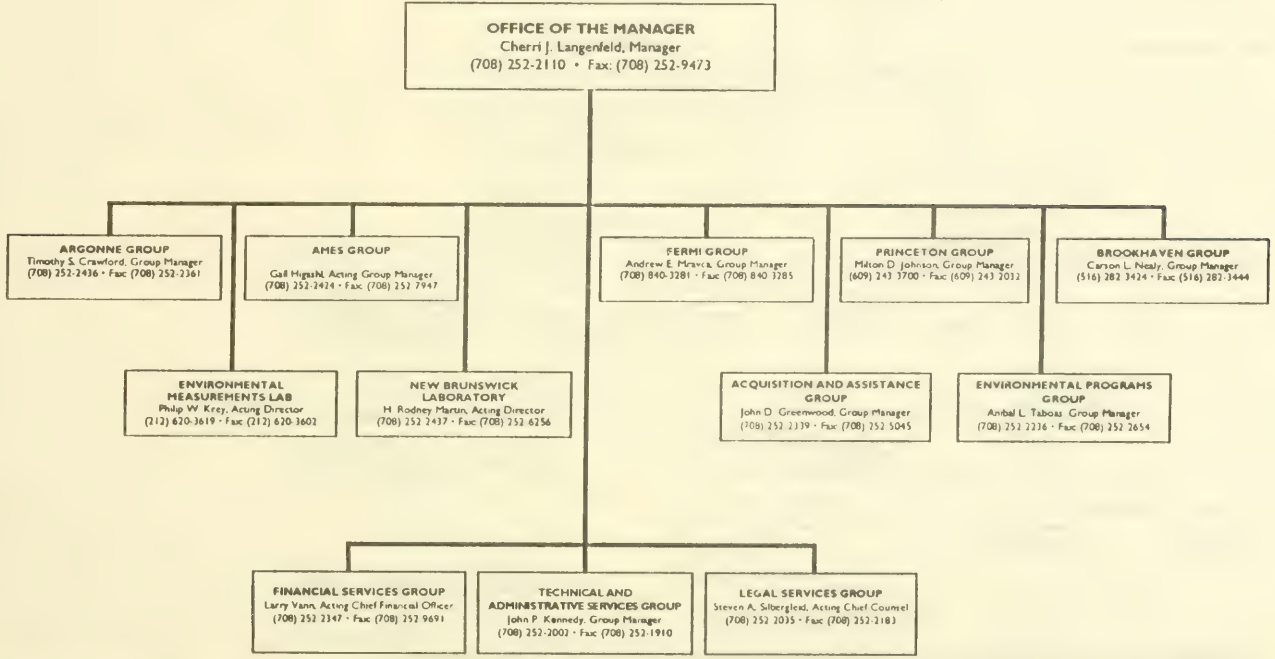


Revised 01/19/96

UNITED STATES DEPARTMENT OF ENERGY
CHICAGO OPERATIONS OFFICE

Resources

Budget Request:	$27,277 (000s)
FTE Allocation:	273
Field Operations Funding %:	1%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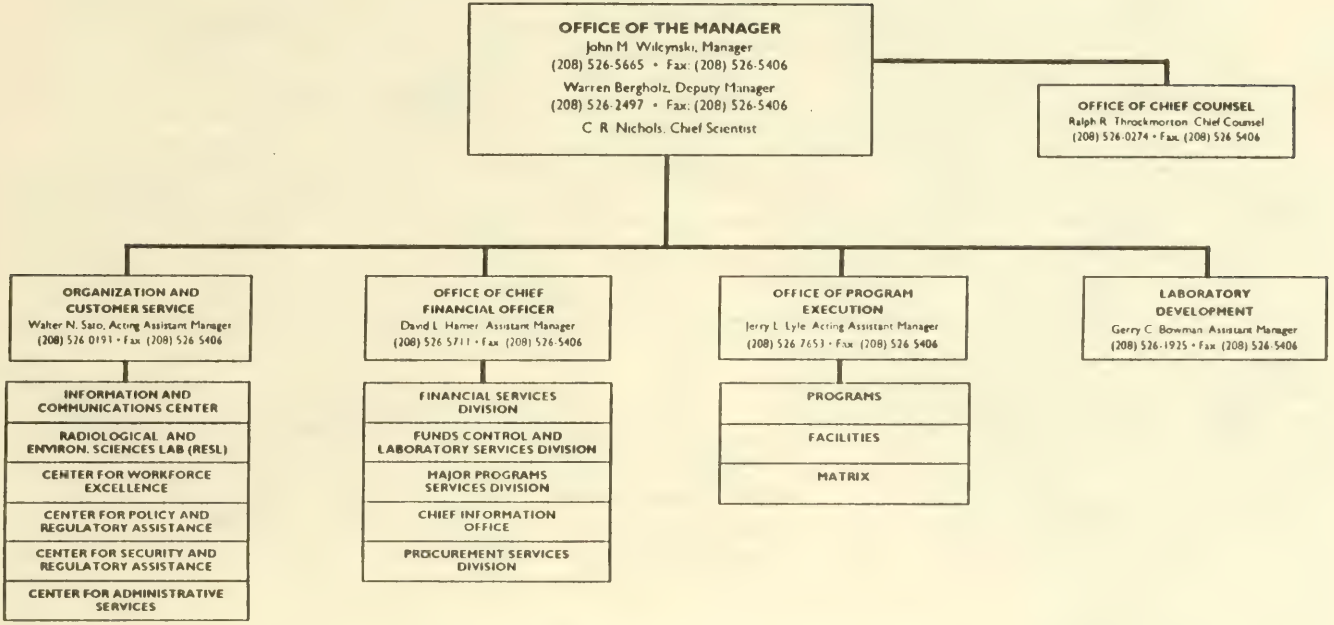
Revised 02/06/96

UNITED STATES DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE

Resources

Budget Request:	$21,911 (000s)
FTE Allocation:	138
Field Operations Funding %:	1%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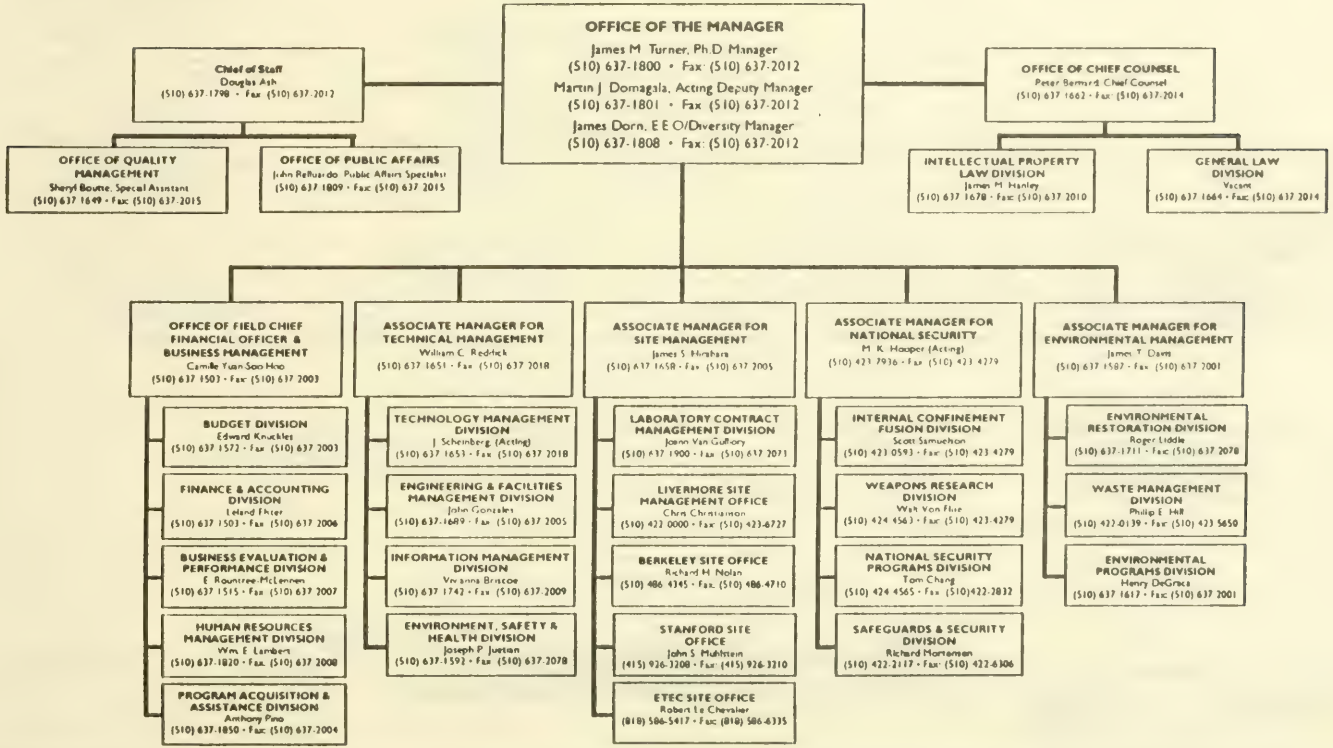
Revised 01/19/96

UNITED STATES DEPARTMENT OF ENERGY
OAKLAND OPERATIONS OFFICE

Resources
Budget Request: $23,249 (000s)
FTE Allocation: 216
Field Operations Funding %: 2%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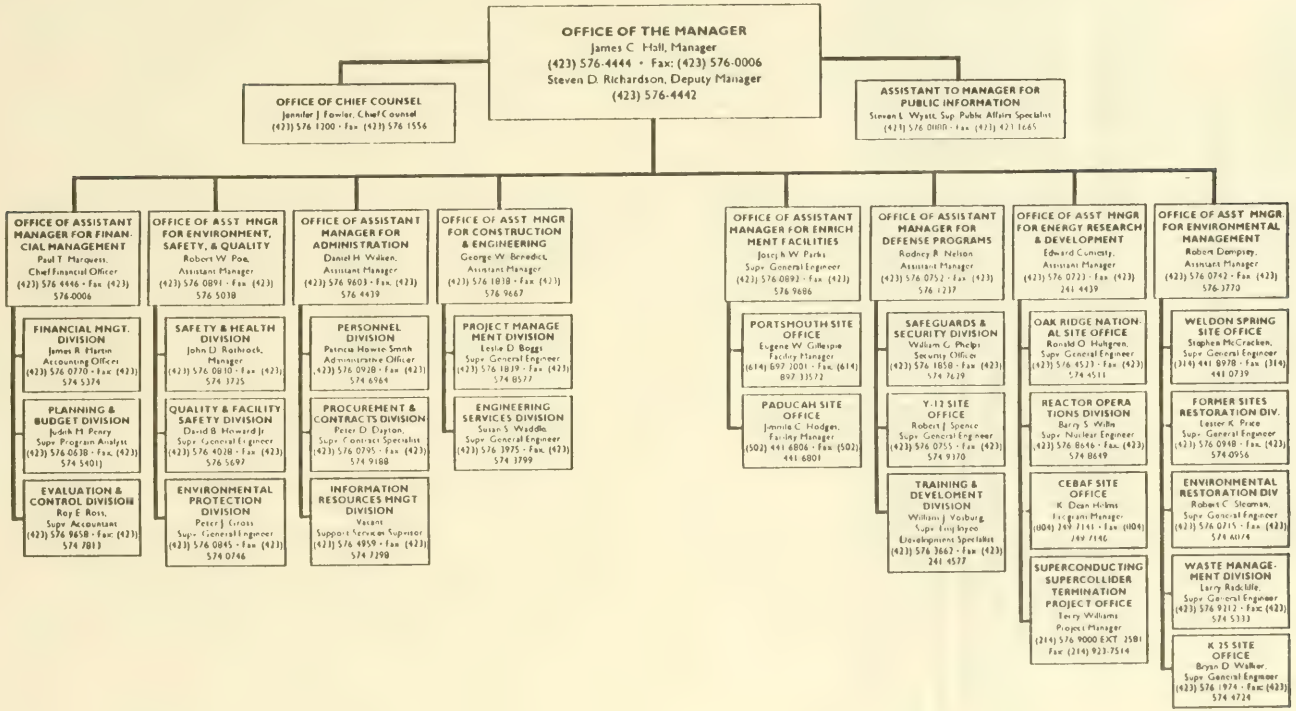
Resources

Budget Request:	$36,484 (000s)
FTE Allocation:	372
Field Operations Funding %:	2%

Revised 01/19/96

UNITED STATES DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS OFFICE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OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF EMPLOYEE CONCERNS

Mr. Myers. Describe the need for an Office of Employee Concerns.

Mrs. Moody. The Office of Employee Concerns was established to serve as an independent, central focal point to receive, review, refer, resolve and respond to concerns of DOE federal, contractor and subcontractor employees. Although the scope of the Employee Concerns Program was originally limited to environment, safety and health issues, it was recently broadened to encompass any issue relating to the Department's facilities, programs, or operations. (This contrasts with the function of the Office of Human Resources and Administration -- and field personnel offices -- which generally address only grievance and personnel-related issues.)

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF EMPLOYEE CONCERNS

Mr. Myers. Please describe the duties and how it will differ from functions performed by Human Resources and Administration or the personnel offices as each field office.

Mrs. Moody. The Employee Concerns Program does not replace existing programs or procedures; rather, it is designed to complement and/or supplement them. Where a program or procedure already exists for resolving a particular concern which an employee has raised, the Office of Employee Concerns will refer the employee to that program/procedure, and may assist the staff of the appropriate office (be it Field Management, Human Resources and Administration, Environment, Safety and Health, etc.) in addressing that concern.

OFFICE OF ECONOMIC IMPACT AND DIVERSITY

OFFICE OF EMPLOYEE CONCERNS

Mr. Myers. What is the staffing and funding level for this office?

Mrs. Moody. The Office of Employee Concerns does not receive direct funding. The function is being performed by staff members of the Office of Economic Impact and Diversity, serving in a collateral-duty capacity.

DEPARTMENT OF ENERGY WEAKNESSES

Mr. Myers. You have now reviewed Department of Energy activities for several years. What would you say are its major weaknesses?

Mr. Layton. The Department of Energy is a complex agency with diverse missions. Although the Office of Inspector General reports in recent years highlight concerns in a number of areas of Departmental operations, we believe the following represent the issues of major vulnerability:

- Contract Administration
- Financial Management
- Project Management
- Environmental Remediation/Compliance

Because these are issues of such major concern, the Office of Inspector General has focused the resources it has available in these areas. Our planning efforts direct us to those areas where we have the best opportunities to facilitate positive change. Our findings frequently have been the basis for concerns reported by the Secretary to the President as part of the Federal Managers' Financial Integrity Act process. Further, they are consistent with major Departmental weaknesses which in the past have been reported by the Office of Management and Budget as part of its High Risk Areas and by the U.S. General Accounting Office under its High Risk Series.

STRENGTHENING WEAKNESSES

Mr. Myers. How could these be strengthened?

Mr. Layton. As noted in the response to the prior question, the Office of Inspector General has, over the years, invested a substantial portion of its available resources in problem identification related to the issues noted above. As part of this process we propose recommendations for actions which will assist the Department in strengthening its processes and procedures to eliminate or minimize its weaknesses and vulnerabilities. The reports, all of which include detailed recommendations for corrective actions, have been provided to the Congress and have been included in our Semiannual Reports to Congress. To give the Committee a better idea of the range of recommendations that have been made to the Department, we have provided copies of our two most recent Semiannual Reports under separate cover.

INSPECTOR GENERAL EMPLOYEES LOCATED AT FIELD SITES

Mr. Myers. How many Inspector General employees are physically located at each field site?

Mr. Layton. Below is a table which I would like to insert in the record. This table shows the sites where the OIG has a presence (as of March 30, 1996), as well as some of the larger DOE sites where the OIG does not have a presence. In addition, approximately 47 of the employees assigned to the Washington, D.C., area perform field services activities.

Field Site	Number of OIG Employees
Albuquerque	31
Brookhaven National Laboratory	0
Chicago	6
Cincinnati	9
Denver	10
FERC	4
Germantown	21
Idaho	9
Kansas City Plant	0
Las Vegas	6
Lawrence Livermore	14
L'Enfant Plaza	18
Los Alamos	4
Morgantown ETC	0
New Orleans	6
Oak Ridge	33
Paducah Site Office	0
Pantex Plant	0
Pittsburgh	12
Portland	2
Princeton	6
Richland	11
Savannah River	17
Schenectady Naval Reactors	0
Southwestern Power Admin.	0
Total	219

CONTRACTOR EMPLOYEE PROTECTION CASES

Mr. Myers. How many contractor employee protection cases were initiated and continued in fiscal years 1993, 1994, 1995, and 1996.

Mr. Layton. The following cases were initiated and continued in FYs 1993, 1994, 1995, and 1996, and are shown in a table which I would like to insert in the record.

	FY 93	FY 94	FY 95	FY 96*	TOTAL
Cases Initiated	41	50	45	30	166
Cases Continued	45	57	68	75	245

* Through April 1, 1996.

CONTRACTOR EMPLOYEE PROTECTION CASE DISPOSITION

Mr. Myers. What was the disposition of each case?

Mr. Layton. The following were case dispositions in FYs 1993, 1994, 1995, and 1996, and are shown in a table which I would like to insert in the record.

	FY 93	FY 94	FY 95	FY 96*	TOTAL
Decisions	7	14	18	11	50
For Complainant	(1)	(2)	(0)	(1)	(4)
For Complainant in Part	(1)	(1)	(4)	(1)	(7)
For Contractor	(0)	(6)	(2)	(1)	(9)
Dismissed	(5)	(5)	(12)	(8)	(30)
Settlements	3	20	13	9	45
Withdrawn	4	6	2	3	15
TOTAL					110

* Through April 1, 1996.

UNOBLIGATED BALANCE

Mr. Myers. How was the Inspector General's Office able to carry over a $7.7 million unobligated balance in FY 1996? The availability of this funding was not identified in the FY 1996 budget request.

Mr. Layton. The OIG was able to carry over a $7.7 million unobligated balance into FY 1996 in large part by downsizing through attrition faster than targets prescribed by the Department's Strategic Alignment Initiative. For example, the OIG was authorized 356 FTEs in FY 1995, but consumed only 339 FTEs. For FY 1996, the OIG is authorized 354 FTEs, including the addition of 14 FTEs for the Office of Contractor Employee Protection (OCEP), but currently has only 328 employees on board. Also, for several years in the early 1990s the OIG was authorized significant staffing increases, but due to recruiting difficulties was unable to meet the authorized FTE levels, resulting in savings that ultimately are reflected in unobligated balances.

These unobligated balances will now be needed to supplement budget authority levels. For example, budget authority for FY 1996 is approximately $3 million less than actual obligations during FY 1995, even though the OIG reduced staffing in FY 1995 to a level significantly below that authorized for FY 1996. (The OIG is authorized 354 FTEs in FY 1996, including 14 FTEs in OCEP, which was transferred to the OIG with no additional funding.) The OIG now has a challenge to comply with such legal mandates as the Chief Financial Officers Act of 1990 and the Government Management Reform Act of 1994, which require for the first time (for FY 1996) audited Departmental financial statements. This will require additional resources and must be performed to the extent possible given the reduced resource levels in FY 1996. This challenge will be exacerbated in the near future when unobligated balances are depleted, if new budget authority does not reflect these requirements.

Unobligated balances were identified in the FY 1996 budget request. While preparing the OIG's FY 1996 Congressional budget request in early 1995, the OIG and the DOE Budget Office estimated that the OIG would utilize unobligated balances of approximately $5,960,000 in FY 1995 and $1,915,000 in FY 1996. The actual utilization of unobligated balances was $1,692,000 in FY 1995 and is projected to be $6,817,000 in FY 1996. Since the Program Funding Profile is required to display budget authority amounts which match the Congressional base table rather than actual obligations, it is necessary to show the original estimates for the estimated use of prior year balances in order to match the Congressional appropriation in a given year. To clarify the situation in the FY 1997 budget request, the OIG added a footnote to the Funding Profile indicating an estimated use of $6,817,000 in prior year unobligated balances during FY 1996, and indicated in the Program Object Class Summary an estimated carryover of $7,714,000 into FY 1996, and $897,000 into FY 1997. The OIG anticipates that all unobligated balances will be exhausted in FY 1997.

OFFICE OF CONTRACTOR EMPLOYEE PROTECTION

Mr. Myers. How many FTEs are in the Office of Contractor Employee Protection? What are the job titles and grade levels of these employees?

Mr. Layton. There are 14 authorized FTEs in the Office of Contractor Employee Protection for FY 1996. There are currently 12 filled positions. The job titles and grade levels are shown below in a table which I would like to insert in the record.

Assistant IG for Contractor Employee Protection	SES	
Adjudicator	GM	15
Program Analysis Officer	GM	15
Vacancy, Policy and Program Officer	GM	15
Investigator	GM	14
Operations Research Analyst	GS	14
Management and Program Analyst	GS	14
Adjudicator	GS	14
Adjudicator	GS	14
Vacancy, Investigator	GS	13
Investigator	GS	12
Adjudicator	GS	11
Secretary	GS	08
Secretary	GS	07

ROLE OF CPA FIRMS

Mr. Myers. With regard to the OIG role in Department audited financial statements, what role (in fiscal years 1995, 1996, and 1997) is anticipated for independent CPA firms in the process? Be specific with regard to OIG FTEs to be utilized relative to independent CPA average man-years of estimated effort.

Mr. Layton. The role of the independent CPA firm has been to assist in the development of detailed audit programs, to support and perform certain aspects of the audit of the Department's Consolidated Financial Statements which require specialized expertise, and to assist in providing opinions on the Financial Statements of the Department's Commercial/Business activities. In Fiscal Year 1995, we devoted about 16 federal FTEs in planning and preparation to perform the financial statement audit. In Fiscal Year 1996, we plan to use 51 federal FTEs to do the financial statement audit and plan a similar level for FY 1997. In Fiscal Year 1995 and Fiscal Year 1996, the budget for the Office of Inspector General included $1.75 million (about 17 staff years) each year for contractor support provided by a CPA firm. The use of such services for Fiscal Year 1997 depends on the level of Budget Authority the Office of Inspector General receives for Fiscal Year 1997.

As is obvious from the data presented in response to this Committee question, the Office of Inspector General is making a significant commitment to the audits of the Department of Energy's consolidated and activity-based financial statements. This is consistent with the requirements of the Chief Financial Officers Act of 1990 and the Government Management Reform Act of 1994.

CONTRACTOR EMPLOYEE PROTECTION

Mr. Myers. Why is a separate office needed to monitor contractor employee concerns? Aren't there other existing protections for contractor employees outside DOE?

Mr. Layton. As part of the Federal Acquisition Streamlining Act (FASA) of 1994, P.L. 103-355, Congress gave the Inspectors General of all civilian and military agencies specific whistleblower protection responsibilities relating to contractor employees. Specifically, Section 6006 of the Act directs the Inspectors General to investigate certain reprisal complaints of contractor employees. In November 1995, as part of the Strategic Alignment Initiative, the Office of Contractor Employee Protection was transferred to the Office of Inspector General to ensure that there is not duplicative implementation of whistleblower protection responsibilities within the Department.

The Office of Contractor Employee Protection pre-existed FASA. This office was in the Office of the Associate Deputy Secretary for Field Management prior to being transferred to the Office of Inspector General. In 1992, the Department promulgated Part 708, title 10, Code of Federal Regulations, which established the Office of Contractor Employee Protection and procedures for protecting DOE contractors and subcontractor employees who make protected disclosures relating to health and safety; waste, fraud, abuse and mismanagement, and other violations of law or regulation; and who subsequently experience reprisal for making those disclosures. The Department has determined that such protection is integral to ensuring that the Department's facilities are well-managed and problems are identified and corrected at an early stage.

There are currently other statutory authorities that provide some protection to contractor employees for whistleblower activity. These are found primarily in the environmental statutes, and provide protection to employees who disclose violations of those laws. In addition, the Energy Reorganization Act (PL 93-438) provides some whistleblower protection to employees of contractors indemnified under the Price Anderson Act. However, Part 708 provides the most comprehensive coverage to DOE contractor employees, including administrative mechanisms to avoid costly judicial litigation. By protecting employees who identify governmental waste, wrongdoing, and health and safety concerns, the Department will become aware of potentially serious problems at the earliest possible time in order to take corrective action.

SMALL BUSINESS INNOVATION RESEARCH (SBIR)

Mr. Myers Please provide a summary of all SBIR-related funding for programs under Energy Supply R&D for the last three fiscal years. Include the account title and the purpose of the funding. At the end of FY95, this program had accumulated an uncosted balance of $68,450,000 representing 99% of the amount available at the start of FY 95.

Dr. Krebs. The table below shows the SBIR-related funding which is contributed by programs under the Energy Supply R&D appropriation. Recall that SBIR funding is a set-aside percentage of the Department's extramural R&D budget. The set aside, mandated by P.L. 102-564, was 1.5 percent in FY 1994 and 2.0 percent in both FY 1995 and 1996. Note that other appropriations within the Department with extramural R&D also contribute to the SBIR program.

	B/A	
	FY 1994	FY 1995
Energy Supply R&D		
Solar Energy	$ 1,375,190	$ 2,299,700
Geothermal Technology Development	138,016	308,800
Hydrogen Research	62,774	90,600
Small Scale Hydropower Development	6,169	12,000
Electric Energy Systems	237,032	356,100
Energy Storage Systems	45,819	51,800
Nuclear Energy R&D	1,708,000	2,463,000
Fusion Energy	4,559,000	6,848,000
Biological and Environmental Research	4,700,000	6,390,000
Basic Energy Sciences	8,784,000	12,219,000
Advanced Neutron Source	243,000	393,000
Energy Research Analyses	55,000	66,000
University and Science Education	825,000	1,078,000
Laboratory Technology R&D Transfer	559,000	1,132,000
Multiprogram Energy Labs - Facility Support	26,000	142,000
Environmental, Safety and Health	253,000	435,000
Total Energy Supply R&D	$23,577,000	$34,285,000

The contributions by program for FY 1996 have not yet been determined by the Chief Financial Officer but will closely approximate FY 1995 amounts because the mandated set aside is 2.0 percent, the same as in FY 1995.

The purpose of all SBIR funding is to increase small business participation in Federal R&D and to increase private sector commercialization of technology developed through Federal R&D.

Mr. Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Dr. Krebs. The March Financial Information System data is not yet available. As of February 29, 1996, the total uncosted balance had decreased to $46,976,903. This represents funds that were obligated in previous fiscal years, but have not yet been costed. The large balance is a consequence of the grant application review and selection process: an annual solicitation is issued early in each fiscal year; about 2,000 applications are received by the solicitation closing date, three months later; the evaluation process takes 4 months, and then two more months are required to negotiate the applications that are selected for award. Consequently, funds are not obligated until the last quarter of the fiscal year, and not costed until the subsequent fiscal year.

As of February 29, 1996, the total unobligated balance was $90,333. Each year, the Comptroller identifies the extramural R&D within all DOE line items and transfers the set-aside percentage into an account within Energy Supply R&D. This transfer usually does not take place until the third quarter. The unobligated balance is very small because most of the FY 1996 funds have not yet been transferred to the SBIR account.

Mr. Myers. Also, please provide narrative describing the program as authorized and the derived benefits to the Department.

Dr. Krebs. The SBIR program, now in its fourteenth year, was established in compliance with the Small Business Innovation Development Act of 1982, P.L. 97-219. The program was extended in October 1992 until the year 2000 by the Small Business Research and Development Enhancement Act of 1992, P.L. 102-564. Federal agencies with extramural R&D budgets exceeding $100 million, including the DOE, are required to set aside 2% of those budgets in FY 1996 to fund SBIR projects in a competition among small science- and technology-based small businesses (500 employees or less). SBIR research explores innovative concepts in important technological and scientific areas of interest to the department, as described in an annual solicitation. The SBIR program enables DOE to obtain effective, innovative solutions to important problems through the private sector, and encourages the conversion of that R&D into commercial applications of economic benefit to the Nation.

RENEWABLE ENERGY PRODUCTION INCENTIVE (REPI)

Mr. Myers. In FY 1995, $4,659,000 was provided for REPI. Last year, the Committee directed that $2,988,000 be provided. What was the carryover balance for REPI at the beginning of FY 1996?

Mrs. Ervin. Originally, in FY 1995, Congress appropriated $3,000,000 for REPI and directed that $7,000,000 additional be provided from other solar and renewable accounts. Subsequently, FY 1995 rescission actions resulted in $5,228,000 being rescinded from the REPI total. This resulted in $4,772,000 as the net funds available for payment. Energy payments to qualified facility owners totaled $693,000. An additional $1,753,000 was returned to the account from which it was originally derived. This left $2,326,000 to be carried forward into FY 1996.

Mr. Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. As of March 1, 1996, uncosted balances are $4,011,096 and unobligated funds totaled $2,329, 586. Currently, DOE has applications from sever organizations covering 11 energy producing projects that will require a total of approximately $2,400,000 in payments from FY 1996 funds. All payments are scheduled to be made in May 1996.

Mr. Myers. Please provide a list of payments to each applicant and DOE's estimate of anticipated participation in this program in the future.

Mrs. Ervin. The following table shows historical and pending payment information for fiscal years 1995 and 1996. FY 1996 data is estimated because OMB has not yet issued the official inflation escalation factor for FY 1995.

Applicant	No. of Projects	FY 95 Payments	Est FY 96 Payment
SMUD, Sacramento, CA	3	$100,725	$220,000
City of Glendale, CA	1	$176,260	$950,000
Lycoming County, PA	1	$100,793	$140,000
Emerald Peoples Utility, OR	1	$167,290	$190,000
UCLA, Los Angeles, CA	1	$148,052	$880,000
Pacific NW Generating Cooperative, Corvallis OR	1	------	$15,000

Waverly Light and Power, Waverly, IA	1	------	$3,000

Future participation in the REPI program could vary between a wide set of limits. The program has accepted applicants for two years and has eight more years in which new projects could be started. If growth of $1,000,000 per year is assumed for the remaining years of the "open window," the funding requirements for 2004 would be approximately $11,500,000 and the program might involve some 3-4 dozen participants who would probably have invested between $200,000,000 and $400,000,000 in their projects. Actual experience could vary 50 - 100% from this example.

CLIMATE CHANGE ACTION PLAN (CCAP)

Mr. Myers. Please provide total funds appropriated that are directly related to the CCAP. Include the account title and the purpose of the funding.

Ms. Ervin. The total FY 96 Funds appropriated, the title of each action, and the purpose of the funding is provided in the table below.

TOTAL DOE CCAP FY 96 FUNDS APPROPRIATED	
TITLE AND PURPOSE OF FUNDING	**FY 96 Appropriations**
Rebuild America: Catalyzing regional and community partnerships to implement energy efficiency investments in new and existing commercial and multifamily buildings	8.1
Partnerships for Technology Introduction: Manufacturer/utility partnerships to develop and commercialize super efficient equipment	4.8
Building Operator Training: Development of materials and facilitation of training to ensure that energy efficiency equipment is operated at peak efficiency	0
Enhanced Appliance Standards: Aggressive implementation of standards	0[1]
Advanced Housing Technologies	0
High Reflectivity Surfaces: Research, development and rating of paving and roofing materials that reduce energy requirements for communities	0
Building Standards: Technical assistance and grants to States to accelerate building code upgrades	5.9
Affordable Low Income Housing: Partnership with HUD to facilitate Energy Efficiency investments in public housing and lower government costs	0
Advanced Architectural Design: Design tools for improving research program output including the use of ENERGY-10	0
Fuel Cells In Buildings	0

Superwindow Collaborative: Technical assistance and partnerships with industry to develop, label, and commercialize the next generation of windows	1.0
Home Energy Rating Systems, energy efficient financing, builder assistance & recognition provided	1.0
Federal Energy Management Partnerships for Technology Introduction: Funds renewable energy projects in Federally owned and leased facilities and demonstrates chiller replacements and steam plant conversions to meet energy service performance contract goals	0
Motor Challenge: Increase the market penetration of efficient motor-driven systems through the replication of Showcase Demonstrations, commitments by Excellence Partners; technical assistance, user education, and market transformation strategies	5.2
Enhance Energy Analysis and Diagnostic Centers: Sponsor university-based energy audits to small and mid-size industrial facilities	0
NICE^3 (National Industrial Competitiveness through Energy, Environment, and Economics) - Seed grants to develop pollution prevention/energy efficiency technologies for widespread industry use	2.9
Renewable Energy Commercialization: Develop & commercialize renewable energy technologies including wind, biomass, photovoltaics , geothermal heat pumps, and geothermal power through collaborative partnerships	27.8
Promote Integrated Resource Planning: Expand technical assistance and outreach to state regulatory bodies to develop IRPs and evaluate efficiency technologies	0
Improve Hydroelectric Generation: Remove market impediments to increased use of environmentally sound hydroelectric generation	0
Evaluate feasibility of efficiency standards for electric transformers: Determine whether energy efficiency standards for electricity distribution transformers should be set and, if warranted, establish test procedures, standards and labeling requirements	0
Coalbed Methane Utilization: Reduce emissions of methane from coal mines while providing the coal industry with a marketable new energy produce	0

Expand Landfill Recovery RD&D: Reduce danger of landfill gas accidents and minimize methane emissions; provide landfill operators new energy source	0
U.S. International Joint Implementation: Encourages cooperative, voluntary, cost-effective projects between the U.S. and developing countries; Projects emphasize technology cooperation and sustainable development	3.2
Climate Challenge: Joint DOE / Electric Utility Industry program that promotes voluntary efforts to reduce, avoid, or sequester greenhouse gas emissions	0
Climate Wise: Partnership program between DOE and EPA, is establishing voluntary public/private partnerships with industry to achieve significant bottom-line improvements in industries resulting form energy efficiency and pollution prevention projects.	3.2

Mr. Myers. Also, please provide funding history since inception of the program and DOE's forecast of future year spending.

Ms. Ervin. The table below provides the funding history since the inception of the CCAP program and forecasts future year spending.

FUNDING HISTORY OF CCAP AND ANTICIPATED FUTURE YEAR SPENDING

CCAP ACTION	95 APRP	96 APPROP	97 CON REQ	FUTURE FUNDING FY'98/FY'99/FY 2000
Rebuild America: Catalyzing regional and community partnerships to implement energy efficiency investments in new and existing commercial and multifamily buildings	5.9	8.1	10.1	10.1/9.0/8.0
Partnerships for Technology Introduction: Manufacturer/utility partnerships to develop and commercialize super efficient equipment	8.3	4.8	11.9	11.9/10.0/9.0
Building Operator Training: Development of materials and facilitation of training to ensure that energy efficiency equipment is operated at peak efficiency	0	0	1.65	1.6/.5/.4
Enhanced Appliance Standards: Aggressive implementation of standards	0[1]	0[1]	1.9	1.9/1.0/.9
Advanced Housing Technologies	0	0	5.0	5.0/4.0/3.0
High Reflectivity Surfaces: Research, development and rating of paving and roofing materials that reduce energy requirements for communities	0	0	1.3	1.3/1.0/.9
Building Standards: Technical assistance and grants to States to accelerate building code upgrades	5.7	5.9	10.5	10.5/9.5/8.5
Affordable Low Income Housing: Partnership with HUD to facilitate Energy Efficiency investments in public housing and lower government costs	0	0	3.1	3.1/2.1/1.1
Advanced Architectural Design: Design tools for improving research program output including the use of ENERGY-10	0	0	1.0	1.0/.9/.8
Fuel Cells In Buildings	0	0	1.0	1.0/.9/.8
Superwindow Collaborative: Technical assistance and partnerships with industry to develop, label, and commercialize the next generation of windows	0	1.0	2.8	2.8/1.8/.8
Home Energy Rating Systems, energy efficient financing, builder assistance & recognition provided	1.0	1.0	4.0	4.0/3.0/2.0

[1] Incremental funding not required

Federal Energy Management Partnerships for Technology Introduction: Funds renewable energy projects in Federally owned and leased facilities and demonstrates chiller replacements and steam plant conversions to meet energy service performance contract goals	0	0	7.0	7.0/6.0/5.0
Motor Challenge: Increase the market penetration of efficient motor-driven systems through the replication of Showcase Demonstrations, commitments by Excellence Partners; technical assistance, user education, and market transformation strategies	5.2	5.2	7.35	7.35/6.3/5.3
Enhance Energy Analysis and Diagnostic Centers: Sponsor university-based energy audits to small and mid-size industrial facilities	0	0	1.0	1.0/.9/.8
NICE^3 (National Industrial Competitiveness through Energy, Environment, and Economics) - Seed grants to develop pollution prevention/energy efficiency technologies for widespread industry use	3.0	2.9	9.0	9.0/8.0/7.0
Renewable Energy Commercialization: Develop & commercialize renewable energy technologies including wind, biomass, photovoltaics , geothermal heat pumps, and geothermal power through collaborative partnerships	54.8	27.8	60.0	60.0 /60.0/55.0
Promote Integrated Resource Planning: Expand technical assistance and outreach to state regulatory bodies to develop IRPs and evaluate efficiency technologies	1.75	0	9	.9/.8/.7
Improve Hydroelectric Generation: Remove market impediments to increased use of environmentally sound hydroelectric generation	0	0	0	0/0/0
Evaluate feasibility of efficiency standards for electric transformers: Determine whether energy efficiency standards for electricity distribution transformers should be set and, if warranted, establish test procedures, standards and labeling requirements	0.1	0	0	0/0/0
Coalbed Methane Utilization: Reduce emissions of methane from coal mines while providing the coal industry with a marketable new energy produce	2.0	0	1.0	1.0/.9/.8
Expand Landfill Recovery RD&D: Reduce danger of landfill gas accidents and minimize methane emissions; provide landfill operators new energy source	0	0	0	0/0/0
U.S. International Joint Implementation: Encourages cooperative, voluntary, cost-effective projects between the U.S. and developing countries; Projects emphasize technology cooperation and sustainable development	3.2	3.2	2.0	2.0/1.0/.9
Climate Challenge: Joint DOE / Electric Utility Industry program that promotes voluntary efforts to reduce, avoid, or sequester greenhouse gas emissions	0	0	1.0	1.0/.9/.8

Climate Wise: Partnership program between DOE and EPA, is establishing voluntary public/private partnerships with industry to achieve significant bottom-line improvements in industries resulting form energy efficiency and pollution prevention projects.	2.4	3.2	4.0	4.0/3.0/2.0

CLIMATE CHANGE ACTION PLAN

Mr. Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Ms. Ervin. The best available data reflects an estimated $53.4 million for uncosted balances and $31.5 million in unobligated funding for the Climate Change Action Plan activities.

CLIMATE CHANGE ACTION PLAN

Mr. Myers. The FY 1997 Budget includes a section entitled "Adjustments to 1996 Continuing Resolution Levels". Under this section is a request for an additional $38,000.000 for several DOE programs including CCAP. Please provide the amount of CCAP's share of the $38,000,000 and a description of how these funds will be used.

Ms. Ervin. The $38 million is a derived number - it represents additional funding above the CR level to reach an add-back for energy conservation of $75 million over the conference level. That add-back funding is intended to be split equally between CCAP, PNGV and weatherization.

FIELD MANAGEMENT PERSONNEL COST

Mr. Myers. The Field Management headquarters (FM) FY 1997 cost per FTE exceeds $102,000 (which is more than $31,000 higher than the average FTE cost for the four operations offices in this account). This average FTE cost for Field Management is considerably higher than numerous other DOE headquarters organizations. Provide specific detail which further defends/justifies this average FTE cost which is considered quite high.

Mr. Pearman. The average civil service grade at the four operations offices is a GS-13, the headquarters (FM) average grade is a GS-14 Step 4. The average salary and benefits for headquarters is $95,000.00 per person. The line also contains Workmens Compensation and Senior Executive Service Awards covering both the Four Field offices and headquarters. The amount is $489,000.00 when prorated is $7,000.00 per person. The headquarters average grade level is a direct reflection of the Department-wide policy and management role of Field Management and the impact of locality pay for Washington, D.C. The diversity of technical and management issues, as well as policy development and implementation for 50 sites nationwide dictates a staff with extensive technical experience and managerial expertise.

SUPPORT SERVICES

Mr. Myers. For the Chicago, Oak Ridge and Field Management headquarters locations, provide detail which further supports and explains the composition of the "Support Services" category. Provide the detail by each office locations showing the element of cost which comprise the office total.

Mr Pearman. The Department is preparing a corporate response to questions similar to this one on support services which will be provided by the end of May.

Mr. Myers. To the extent that support service contracts comprise part of the total, provide the information by contract, deliverable to the DOE, description of task(s), related average man-years of effort and related contract cost.

Mr. Pearman. The Department is preparing a corporate response to questions similar to this one on support services which will be provided by the end of May.

FIELD OPERATIONS "OTHER RELATED EXPENSES"

Mr Myers. For each of the four (4) operations offices, provide additional detail describing by element of cost the composition of the "Other Related Expenses" category; provide the related cost estimates for each element of cost component.

Mr. Pearman. Other Related Expenses includes rent, utilities, telecommunication, postage, printing, reproduction, building operations, logistical services, automated data processing development and acquisition, employee development and training, health services, shipment and storage of household goods, supplies, furniture and vehicle and office equipment maintenance and capital equipment. I am providing a chart which contains a detailed breakout by object class for each of the offices in the account.

Mr. Myers. Is the majority of the cost in this category related to the working capital fund? If there are elements of cost which are significant other than the working capital fund, provide detail?

Mr. Pearman. The Office of Field Management FY 1997 Working Capital Fund request supporting headquarters is $1,715,000 or 5% of the $32,066,900 of the "Other Related Expenses" request for the Field Operations Account. The field does not contribute to the Working Capital Fund. The majority of the "Other Related Expenses" is contained within the "Other Services" object class which provides for personnel developmental training; maintenance of Automate Data Processing (ADP) systems; procurement of hardware/software; and service contractors providing facility operational services (for example guards, janitorial services, mail rooms, ground and road maintenance); at the four Operations Offices.

Energy & Water

Field Operations Other Related Expenses

Object Class	Chicago	Idaho	Oak Ridge	Oakland	Field Management	TOTAL
22.0 Transportation of Things	$30,200	$50,200	$49,500	$16,500	$0	$146,400
23.1 Rental Payments to GSA	$0	$0	$1,400,000	$3,000,000	$928,000	$5,328,000
23.2 Rental Payments to Others	$0	$1,329,000	$61,150	$35,000	$0	$1,425,150
23.3 Communications, utilities, misc charge	$1,328,000	$228,000	$0	$900,000	$236,000	$2,692,000
24.0 Printing and Other	$585,000	$0	$0	$20,000	$71,000	$676,000
25.2 Other Service	$2,676,000	$9,325,500	$2,812,000	$2,559,300	$997,000	$18,369,800
25.3 Purchase of goods & service	$0	$0	$1,823,000	$361,200	$9,000	$2,193,200
26.0 Supplies & materials	$141,700	$35,300	$99,350	$398,000	$62,000	$736,350
31.0 Capital Equipment	$86,000	$141,000	$215,000	$44,000	$14,000	$500,000
TOTAL, Other Related Expenses	$4,846,900	$11,109,000	$6,460,000	$7,334,000	$2,317,000	$32,066,900

FIELD OPERATIONS OBLIGATIONS PERFORMANCE

Mr Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996?

Mr Pearman. I am providing a table which details account balances by office.

OFFICES	UNCOSTED	UNOBLIGATED
Chicago	$ 4,595,249	$ 2,484,787
Idaho	$ 4,907,973	$ 6,190,009
Oak Ridge	$ 4,861,657	$ 5,226,724
Oakland	$ 3,088,307	$ 4,293,436
Sub-Total, Field Offices	$17,453,186	$18,194,956
Field Management	$ 4,078,974	$ 4,015,472
TOTAL, Field Operations	$21,532,160	$22,210,428

PARTNERSHIP FOR A NEW GENERATION OF VEHICLES (PNGV)

Mr. Myers. Please provide total funds appropriated that are directly related to the PNGV. Include the account title and the purpose of the funding.

Ms. Ervin. The FY 1995 appropriation and FY 1996 Conference Mark, which directly support the Partnership for a New Generation of Vehicles (PNGV) program within the Department of Energy, are shown in a table which I would like to insert in the record.

[The information follows:]

Department of Energy
Partnership for a New Generation of Vehicles
(dollars in millions)

Energy Conservation	FY 1995 Approp.	FY 1996 Conf. Mark
Transportation Technologies		
Electric Drive Vehicle Technologies		
Hybrid Vehicle R&D	$45.5	$53.3
Fuel Cell R&D	$22.2	$21.5
Capital Equipment	$ 1.0	$ 0.8
Transportation Materials Technologies		
Propulsion Systems Materials	$ 7.3	$ 7.7
Light Weight Vehicle Materials	$10.0	$10.8
Capital Equipment	$ 0.0	$ 0.2
Combustion Engine R&D		
Light Duty Piston Engine R&D	$ 2.7	$ 3.9
Light Duty Combustion Efficiency	$ 1.8	$ 1.4
Capital Equipment	$ 0.0	$ 0.2
Subtotal, Energy Conservation PNGV	$90.5	$99.8
Energy Supply Research and Development		
Energy Research*		
Basic Energy Sciences	$ 0.0	$ 5.0
Laboratory Technology Transfer	$ 3.2	$ 1.4
Defense Programs	$ 27.7	$13.3
Subtotal, Energy Supply R&D PNGV	$30.9	$19.7
TOTAL, DIRECT DOE PNGV	**$121.4**	**$119.5**

* FY 1996 funding for the Energy Research program is based upon actual appropriations,

not a conference mark.

Mr. Myers. Also, please provide funding history since inception of the program and DOE's forecast of future year spending.

Ms. Ervin. The Partnership was signed by President Clinton in September 1993; FY 1995 was the first year for which the Administration submitted a budget specifically requesting PNGV funds. DOE's funding, including projections through FY 2005, is shown in a table which I would like to insert in the record.

[The information follows:]

Partnership for a New Generation of Vehicles
Direct Funding: Outyear Projections
(dollars in millions)

	FY95 Appr.	FY96 Est.	FY97 Req.	FY98 Proj.	FY99 Proj.	FY00 Proj.	FY01 Proj.	FY02 Proj.	FY03 Proj.	FY04 Proj.	FY05 Proj.
DOE	93.7	106.2	161.0	199.6	217.6	208.9	192.2	174.9	167.9	112.9	107.3

Mr. Myers. During the life of this program, were federal resources provided to any manufacturers other than Chrysler, General Motors, and Ford? If so, please provide the amount of assistance, when the resources were provided, and the source of the funds.

Ms. Ervin. Approximately 78 percent of the Department's PNGV funding is provided directly to a broad spectrum of industrial firms, universities, and national laboratories for research and development on advanced heat engines, fuel cells, high power devices, and advanced materials. Of the 22 percent of the Department's funding that is provided to Chrysler, Ford, and General Motors, approximately 75 percent is passed on to suppliers and universities, along with matching funds provided by the auto manufacturers. From the DOE Energy Conservation appropriation account for fiscal years 1995 and 1996, funds for research and development of advanced heat engines, materials, fuel cells, hybrid vehicles, and batteries have been provided to approximately 97 suppliers and six universities.

Mr. Myers. Since DOE is the lead agency, please include ALL sources of federal funds related to this program.

Ms. Ervin. Although DOE has the majority of PNGV-related research and development funding, the Department of Commerce is the designated lead agency for the partnership. In FY 1997, funding has specifically been requested for PNGV activities by the Departments of Commerce, Energy, and Transportation, the National Science Foundation, and the Environmental Protection Agency. While there are activities in other agencies that may ultimately contribute to PNGV, the primary purpose of these activities is not directly supportive of PNGV.

Mr. Myers. Please provide a detailed summary of accomplishments in FY's 1995 and 1996.

Ms. Ervin. I would like to insert in the record a detailed summary of Energy Efficiency and Renewable Energy's PNGV accomplishments for FY 1995 and FY 1996.

[The information follows:]

DETAILED SUMMARY OF FY 1995 ACCOMPLISHMENTS

- General Motors (GM) completed the first year of a 30-month Phase II effort to build and demonstrate a 50-kilowatt methanol-fueled proton-exchange-membrane (PEM) fuel cell propulsion system. Technical accomplishments in FY 1995 included the identification of a reformer catalyst with twice the activity of the best previously known reforming catalyst; fabrication and evaluation of electrodes with ultra-low platinum loadings; successful development of coatings for aluminum and titanium bipolar plates; design, build, and testing of full-size 330-cm^2 active area cells; and achievement of integrated, stand-alone operation of a 10-kilowatt brassboard PEM fuel cell system using a Powerex air compressor-expander.

- Ford and Chrysler developed preliminary vehicle designs for fuel cell-powered cars which provide system requirements for fuel cell development activities; both automaker have suppliers in the process of assembling 10-kilowatt PEM fuel cell stacks.

- Arthur D. Little developed and tested a 25-kilowatt partial oxidation reformer suitable for on-board processing of ethanol fuel for fuel cell systems.

- Argonne National Laboratory developed and tested a 10-kilowatt catalyzed, low-temperature, compact and quick-starting partial oxidation reformer for methanol fuel.

- Los Alamos National Laboratory achieved significant increases in performance of direct methanol fuel cells; a current density of 370 mA/cm^2 at a cell voltage of 0.5 volts, more than twice the current density of the best previous technology.

- GM completed assembly and initial tests of all the Generation 1 hybrid vehicle propulsion system components and accessories. This includes the thermal management system, traction motor, regenerative brake hardware, electric power steering, electric air conditioning, and other subsystems.

- Ford completed the systems analysis and trade studies and selected the final hybrid vehicle configurations and component specifications. The completion of this important study allowed early elimination from the program of those technologies deemed too technically immature to satisfy the 1998 contracted time frame.

- Ford awarded a contract for design, development and testing of the first direct injected, compression ignition hybrid power unit in the hybrid program. This engine, when integrated into the parallel hybrid drive train, has potential to yield the highest projected fuel economy of all the auxiliary power unit alternatives under development for the 1998 milestone of doubling fuel economy.

- DOE's Oak Ridge National Laboratory (ORNL) and the Navy Surface Warfare Center (NSWC) in Annapolis are developing plans to demonstrate the functional definition for a Power Electronic Building Block (PEBB) to improve weight, cost, and size characteristics of power control devices. This demonstration is planned for August 1996. The NSWC team will demonstrate a single 250-kilowatt functional PEBB that can perform various high power conversion functions, such as motor controller and inverters. The ORNL work is focused on a 100-kilowatt, soft-switched circuit to perform similar functions.

- The PEBB program developed a vertically integrated structure of component developers, system suppliers, and end users working with academia and government to bring superior technology to market and provide a competitive edge in global markets. The PEBB program is rapidly progressing toward national program status.

- The hybrid vehicle gas turbine program achieved breakthroughs in manufacturing high efficiency regenerator cores by extrusion and molded durable high temperature insulation, two potentially low-cost processes essential to a competitive, viable automotive gas turbine.

DETAILED SUMMARY OF FY 1996 ACCOMPLISHMENTS

- Under the General Motors fuel cell program, Delphi Engineering designed and assembled a 30-kilowatt methanol reformer which produces hydrogen from methanol. Two 30-kilowatt stacks were fabricated and will undergo performance testing on methanol reformate. A 10-kilowatt preferential oxidizer reactor was tested and integrated with the 10-kilowatt fuel cell breadboard. This reactor is important for cleaning the carbon monoxide gas from the reformate stream that feeds the fuel cell.

- Under the Ford fuel cell program, Lawrence Livermore National Laboratory and EDO Fiber Science developed an advanced composite tank for storing 5,000 pounds per square inch hydrogen onboard the vehicle. This tank, which has a specialized bladder to prevent hydrogen leakage, greatly improves on the storage density of conventional pressurized storage containers.

- Under the Ford fuel cell program, Directed Technologies Incorporated completed draft hydrogen safety and fueling infrastructure assessments for transportation technologies. These assessments evaluate various hydrogen storage mechanisms and processes, such as remote reforming, on-site reforming, electrolysis, etc., for getting hydrogen onboard the vehicle.

- Arthur D. Little scaled up its 25-kilowatt, multifuel fuel cell reformer to 50-kilowatts. This reformer has been tested under steady state conditions using ethanol. By the end of FY 1996, transient testing, which more realistically represents driving conditions, will be completed.

- Argonne National Laboratory initiated development of an on-site fuel cell testing facility. This facility will provide the Department of Energy with independent testing capabilities for automotive fuel cell propulsion systems.

- GM completed the design, construction, and bench testing of the first gas turbine hybrid power unit. This turbine alternator is the power source for the Generation 1 hybrid test-bed vehicle. It will provide power to the traction motor for propulsion and to the battery and vehicle auxiliaries. The unit incorporates many innovative concepts to reduce size and cost, and to maximize efficiency.

- GM completed the development, assembly, and bench testing of the battery pack for the Generation 1 hybrid test-bed vehicle. This high power lead acid battery pack has been integrated into the vehicle and will soon be undergoing dynamometer tests. The pack incorporates all the thermal management, monitoring, and controls necessary to ensure maximum performance and battery life.

- GM completed modifications of two 1995 Lumina sedans to accept the Generation

l hybrid components. This includes removal of the stock power train and completing structural, chassis, and interior modifications. The two vehicles are for the Stirling and gas turbine series hybrid power trains. Installation and checkout of propulsion system components in a gas turbine vehicle is near completion.

- Ford completed fabrication of all the components for a prototype flywheel energy storage system. This flywheel will meet the PNGV minimum performance requirements for a flywheel. The flywheel will be subject to rigorous performance testing that will provide valuable data about the future application of this technology to advanced vehicles.

- Structural modifications on the Ford Ecostar turbine test-bed vehicle were completed. The natural gas tanks, high pressure lines, valves, and controls were installed. Other vehicle subsystems are being installed.

- Research and development projects, selected competitively through the United States Advanced Battery Consortium, were initiated for high power batteries and ultracapacitors for hybrid vehicle applications. Fabrication and testing of prototype cells were initiated.

Mr. Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Ms. Ervin. As of the end of February 1996, the last month for which we have published data, $39.6 million remains uncosted and $79.6 million remains unobligated for the PNGV programs managed by the Office of Energy Efficiency and Renewable Energy.

Mr. Myers. The FY97 Budget includes a section entitled "Adjustments to 1996 Continuing Resolution Levels." Under this section is a request for an additional $38,000,000 for several DOE programs including PNGV. Please provide the amount of PNGV's share of the $38,000,000 and a description of how these funds will be used.

Ms. Ervin. With the additional funds, $19,000,000 has been proposed for Electric Drive Vehicle Technologies to support the five-year development efforts on hybrid propulsion systems, aimed at 50 mile per gallon fuel economy in a six passenger vehicle, or twice the fuel economy of current comparable vehicles.

QUALITY METRICS

Mr. Myers. Please provide a description of this program, including history and funding sources(s). How does this program "exceed the requirements" of the Government Performance and Results Act of 1994.

Ms. Ervin. The Quality Metrics (QM) program is a process that EE has undertaken for the past 2 years to estimate the outyear benefits of EE programs to inform budget allocation decisions for our programs. As part of this, EE has sought external review on the validity of the analysis including EIA, stakeholders, DOE labs, and industry. Currently Arthur D. Little is working with EE to better estimate the benefits of programs. Parts of this review have been voluntary, and when modest costs to this review were incurred they have been paid for by DOE. In developing Quality Metrics and Performance Metrics (PM) we effectively began quantitative goal setting and performance reporting. In our pilot GPRA we have undertaken annual performance plans and reports, required benefits estimation and performance measures development throughout the organization and used that information to advise our portfolio process. In developing this process, the office of EE&RE is substantially ahead of the GPRA timetable - thus exceeding the requirements.

USE OF PRIOR YEAR BALANCES AND OTHER ADJUSTMENTS

Mr. MYERS. The budget includes negative totals for FY 1996 and FY 1997 ($–81,230,000 and $–48,177,000, respectively) on the line "Use of prior year balances and other adjustments." Please provide further detail, including what amount is prior year balances, a description and amount for each "other adjustment," and the appropriate account to which the adjustment should be made (e.g., Nuclear energy, Energy research, etc.) with an explanation for the adjustment.

Mr. VIVONA. I would like to provide the following table for the record, which shows these adjustments in a greater level of detail.

	FY 1996 Appropriation	FY 1997 Request
Energy Efficiency and renewable energy		
Use of prior year balances	-15,800	—
General reduction	—	-18,932
Nuclear Energy		
Use of prior year balances	-4,961	—
General reduction	—	-3,065
Environment, Safety and Health		
Use of prior year balances	-4,396	—
General reduction	—	-1,421
Energy Research		
Use of prior year balances	-35,982	—
General reduction	—	-21,203
Technical Information Management		
Use of prior year balances	-180	—
General reduction	—	-13
Environmental Management		
Use of prior year balances	-19,911	—
General reduction	—	-3,543
Total, ESRD use of prior year balances and other adjustments	-81,230	-48,177

Additionally, I'd like to note that, by longstanding practice with this subcommittee, appropriations offsets funded through use of prior year balances have not typically been allocated as above-the-line adjustments in either the Department's budget justifications or the subcommittee's support tables.

SOLAR AND RENEWABLE RESOURCE TECHNOLOGIES

Mr. Myers. In FY 1991, Solar and Renewable energy funding was $199 million. Just four years later, in FY 1995, $388 million was appropriated -- a 95% increase! As a result of these large increases the Solar and Renewable program was so flush with funds that at the end of February 1996 half a million dollars remained unallocated, $137 million remained unobligated and $269 million remained uncosted. Five months into the current fiscal year, the Department had an unspent balance of $406.8 million. That's 148% of the amount the Congress appropriated last year. This year, the Administration is requesting $370 million for the Solar and Renewable program -- a 28% increase. What is the justification for such an increase given the massive building up of prior-year funds?

Mrs. Ervin. Using the figures cites, at the approximate half-way point in the fiscal year about 2/3 of the funds are obligated and about 1/3 are unobligated. In our view, this is a relative normal situtation for many Federal programs. Once the funds are obligated, they are targeted or committed for specific activities and, as explained in response to earlier questions, costing occurs at a more gradual pace. Thus the size of uncosted obligations should not be considered cause for concern and, in our view, do not directly impact year to year budget requests. The increase in the FY 1997 budget request is requested to restore the more vital elements of core technology R&D and selected cooperative DOE/indsutry deployment efforts that were reduced or postponed as a result of FY 1995 rescissions and FY 1996 reduced appropriations. Significant advancements in the renewable technologies have occurred in recent years and market penetration activities are udnerway. DOE programs are playing and will play particularly important roles in helping U.S. industry establish commercial footholds leading toward a profitable, unsubsidized indsutry.

SOLAR AND RENEWABLE ENERGY

Mr. Myers. For the record, for FY's 1991 through 1996, for each of the fourteen programs under the Solar and Renewable account in the FY 1997 budget structure, please provide the following: 1) program funding history, 2) associated cost-share ratios, 3) the estimated number of companies in each industry; 4) the volume of domestic and internatinal production, and 5) an estimate of the total amount the industry spent on R&D in each year. Please show amount and details on a comparable basis to the FY 1997 structure.

Mrs. Ervin. Tables reflecting the requested information for the programs are attached.

Photovoltaic Energy Systems Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$46.5	$60.5	$63.7	$74.8	$83.8	$61.6
Cost-share Ratio (Indus:Govt)	1 : 2.5	1 : 4	1 : 2.8	1 : 2.2	1 : 2	1 : 2
No. of companies	For the years 1991-1996, there were (are) approximately 50 U.S. companies that manufactured photovoltaic equipment. This includes solar cells, modules, charge controllers, current inverters, storage batteries, and photovoltaic-powered end-user devices. Additionally, there were (are) about 125 U.S. companies that provide photovoltaic distribution, contracting, or engineering services.					
Domestic and international production volume	55.4 MW	57.9 MW	60.1 MW	69.4 MW	79.6 MW	91.0 MW (est)
domestic R&D (excl. cost-sharing)	This answer depends on unpublished industry information. However, a rough estimate is that US industry spent approximately the same amount as DOE on photovoltaic R&D. In particular, Energy Conversion Devices, Siemens Solar Industries, and Texas Instruments are believed to have spent tens of millions of dollars each during the last five years.					

Utilities Solar Thermal Energy Systems Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$11.4	$20.8	$21.4	$23.6	$23.9	$19.3
Cost-share Ratio (Indus:Govt)	1 : 3	1 : 3	1 : 3	1 : 2	1 : 2	2 : 3
No. of companies*	15	15	20	20	25	30
Domestic and international production volume	0	0	0	0	0	0
domestic R&D (excl. cost-sharing)	0	0	0	0	0	0

* The companies involved in the solar thermal electric (STE) industry include energy users, equipment manufacturers and suppliers, system integrators, power producers, and utilities. In the 1980's, there were 6 to 10 companies involved in the trough projects and several more in the pilot power tower project. Today, there are more than 30 major companiesworking to bring trough, tower, and dish technologies into the marketplace before, or just after, the turn of the century.

Utilities Biofuels Energy Systems Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$3.2	$4.0	$4.7	$9.8	$14.3	$20.6
Cost-share Ratio (Industry:Govt)	3 : 2	Not applicable	Not applicable	1 : 20	1 : 7	1 : 2
No. of companies*	6	6	6	8	8	27
Domestic and international production volume	10,275 MW	10,575 MW	10,875 MW	11,145 MW	11,340 MW	11,775 MW
domestic R&D (excl. cost-sharing)	0	0	0	0	0	0

Transportation - Biofuels Energy Systems Program

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$20,686	$29,400	$36,657	$39,414	$31,900	$26,385
Cost-share Ratio (Industry:Govt)	1:11	1:10	1:10	1:10	1:4.5	1:4.0:1(est.)
No. of companies	Currently, there are no companies producing transportation fuels from cellulosic biomass. We are aware of at least five companies in various planning and development stages, including site selection, licensing, facility design, of ethanol facilities. (There are around 35 companies producing ethanol from grain, some of these companies are potential users of the technologies developed by the program.)					5
Domestic and international production volume	Domestic cellulosic biomass-based liquid transportation fuels are not being currently produced commercially. The international production of ethanol of 3.5 billion gallons per year is primarily in Brazil and is a sugar-based industry. (The commercial domestic production capacity of ethanol from grain, primarily corn is 1.6 billion gallons per year).					
domestic R&D (excluds cost-sharing)	Private sector R&D investment information is not available.					

Wind Energy Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$13.9	$21.3	$23.2	$28.6	$45.03	$31.55
Cost-share Ratio (Industry:Govt)	0.07 : 1	0.09 : 1	0.13 : 1	0.18 : 1	1.07 : 1	0.44 : 1
No. of companies	6	7	10	12	18	18
Domestic and international production volume	200 MW	230 MW	320 MW	800 MW	1400 MW	1400 MW
domestic R&D (excl. cost-sharing)	$3	$3	$3.5	$4	$5	$5

Renewable Energy Production Incentive

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$0	$0	$0	$0	$4.7	$.7
Cost-share Ratio	Not Applicable					
No. of companies	Not Applicable					
Domestic and international production volume	Not Applicalble					
Domestic R&D (excl. cost-sharing)	Not Applicable					

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$5.1	$11.5	$6.5	$6.0	$6.0	$2.0
Cost-share Ratio	Not Applicable					
No. of companies	Not Applicable					
Domestic and international production volume	Not Applicalble					
Domestic R&D (excl. cost-sharing)	Not Applicable					

Resource Assessment Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$1	$1.2	$1.2	$2.3	$3.8	$1.2
Cost-share Ratio	Not Applicable					
No. of companies	Not Applicable					
Domestic and international production volume	Not Applicalble					
Domestic R&D (excl. cost-sharing)	Not Applicable					

Solar and Renewable Energy Deployment Program History

	FY 1991	FY 1992	Category	FY 1994	FY 1995	FY 1996
Funding History	$3.7	$3.0	$3.9	$21.4	$28.9	$14.6
Cost-share Ratio	Commercialization Ventures only (FY 1994- FY 1996): Industry cost-share is mandated at 50/50; however, the most recent solicitatin attracted industry funds equal to 60% of the total amount invested in th projects.					
No. of companies	Not applicable -- these programs represent all renewable energy industries.					
Domestic and international production volume	Not applicable -- these programs represent all renewable energy industries.					
Domestic R&D (excl. cost-sharing)	Not applicalbe -- these programs represent all renewable energy industries.					

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$27.1	$27.2	$23.4	$23.0	$40.4	$28.3
Cost-share Ratio (Ind: Govt)	2:1	2:1	2:1	2:1	2:1	2:1
No. of companies	100	100	100	100	171**	200**
Domestic and international production volume	249 MW(e)*	249 MW(e)*	249 MW(e)*	249 MW(e)*	250 MW(e)*	790 MW(e)*
Domestic R&D (excl. cost-sharing)	$20.0	$20.0	$20.0	$30.2	$35.4	$32.6

* Installed capacity, excluding geothermal heat pumps (GHP)

** Start-up of GHP consortium

Hydrogen Research and Development

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$2.5	$1.4	$3.9	$10.0	$10.0	$14.5
Cost-share Ratio (Indus: Govt)	0	0	0	0	1:1	.68:1
No. of companies	1	3	3	3	5	5
Domestic and international production volume	0	0	0	0	0	0
Domestic R&D (excl. cost-sharing)	6	8	8	12	12	21

Currently, there are no commercial renewable hydrogen facilities

Category	Program	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	EMF	$3.4	$5.0	$6.08	$9.6	$13.1	$9.7
	T&D	$1.5	$3.1	$3.1	$5.8	$5.8	$0
	HTS	$21.31	$21.1	$21.7	$18.3	$17.7	$22.6
	STG	$6.5	$5.2	$5.5	$6.6	$4.8	$9.7
	CE	$1.0	$1.1	$.9	$.3	$0	$0
Cost-share Ratio	EMF	3 : 1	2.4 : 1	1.2 : 1	1.5 : 1	1.5 : 1	1.2 : 1
	T&D	0.25 : 1	0.16 : 1	0.16 : 1	0.08 :1	0.14 : 1	0.0 : 0
	HTS	1.17 : 1	1.03 : 1	0.84 : 1	1.55 :	1.68 : 1	1.50 : 1
	STG	0.32 : 1	0.43 : 1	0.43 : 1	0.45 : 1	0.70 : 1	0.78 : 1
No. of companies	EMF	N/A	N/A	N/A	N/A	N/A	N/A
	T&D	N/A	N/A	N/A	N/A	N/A	N/A
	HTS	20	26	32	38	44	50
	STG	14	14	15	15	15	15
Domestic and international production volume	EMF	N/A	N/A	N/A	N/A	N/A	N/A
	T&D	N/A	N/A	N/A	N/A	N/A	N/A
	HTS	720/1000	800/N/A	600/N/A	700/N/A	800/2400	1000/3000
	STG	5.0	6.0	6.0	5.5	2.0	2.0
Domestic R&D (excl. cost-sharing)	EMF	11.0	11.0	11.0	10.0	8.0	7.0
	T&D	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	HTS	5.3	6.0	6.0	8.0	9.0	11.0
	STG	2.0	2.0	2.0	2.0	2.0	2.0

EMF = Electric and Magentic Fields R&D
T&D = Transmission and Distribution R&D
HTS = High Temperature Superconductivity R&D
STG = Energy Storage R&D
CE = Capital Equipment

Industry Biofuels Energy Systems Program History
Municipal Solid Waste - Landfill Gas and Anaerobic Digestion)

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$300,000	$822,000	$1,073,000	$1,190,000	$1,126,000	$1,524,000
Cost-share Ratio (Ind: Govt)	0 : 0	.18 : 1	.14 : 1	.4 : 1	.18 : 1	.14 : 1
No. of companies	~30	~ 30	~ 35	37	37	43
Domestic and international production volume	43 MW domestic only	17 MW domestic only	24 MW domestic only	26 MW domestic only	26 MW domestic only	20 MW domestic only
domestic R&D (excl. cost-sharing)	industry proprietary data	industry proprietary data	industry proprietary data	industry proprietary data	industry proprietary data	industry proprietary data

Industry Solar Thermal Energy Systems Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY96
Funding History	$7,692K	$7,950K	$4,863K	$7,236K	$6,857K	$4,784K
Cost-share Ratio	.032 : 1	.094 : 1	.92 : 1	.77 : 1	.53 : 1	.50 : 1
No. of companies	55	52	48	46	43	40
Domestic and international production volume	domestic only * 238,000 ft2	231,000 ft2	275,000 ft2	601,000 ft2	250,000 ft2	Not Available
domestic R&D (excl. cost-sharing)	Not available	Not available	Not available	Not available	Not available	Not available

* This is the domestic production of flat plate and parabolic trough solar collectors to produce hot air/hot water - not electricity. International production is much greater but not available.

Policy and Management Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$1,647	$1,905	$2,859	$3,878	$17,792	$13,975
Cost-share Ratio	Not Applicable					
No. of companies	Not Applicable					
Domestic and international production volume	Not Applicalble					
Domestic R&D (excl. cost-sharing)	Not Applicable					

In-House Energy Management Program History

Category	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
Funding History	$0	$0	$0	$0	$30,632	$342
Cost-share Ratio	Not Applicable					
No. of companies	Not Applicable					
Domestic and international production volume	Not Applicalble					
Domestic R&D (excl. cost-sharing)	Not Applicable					

Mr. Myers. Solar and renewable energy technologies funding is increased this year. However, there seems to be a change in emphasis. Previous efforts emphasized expanded use of these technologies in this country to meet energy needs. Now the emphasis is clearly on marketing these technologies to other countries. Why is the Department of Energy the appropriate agency to market these technologies?

Mrs. Ervin. The principal motivation for DOE spending on renewable energy programs has been and continues to be the promise that these technologies offer for meeting U.S. energy needs. Assistance to the emerging domestic renewable energy industry in its efforts to penetrate international markets is an important but secondary role for the Department. In several technology areas, international markets currently offer a growth opportunity for U.S. firms. This is particularly true for the geothermal, wind, and photovoltaic industries where higher prevailing electricity cost in certain areas of the world creates attractive potential markets. Participation in these markets helps strengthen U.S. firms financially, improves the U.S. position relative to its international competitors, and helps the technologies reach domestic performance and cost goals. It is in the interest of the entire nation that these efforts succeed.

SOLAR BUILDING TECHNOLOGY RESEARCH

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $3,165,000, representing 73% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Ms. Ervin. Because this is the first of a number of questions about uncosted balances, it's worth making a few general observations at this point. Both OMB and CBO use an estimate of 45 percent for the first-year spendout in the Energy Supply R&D account. This is based on historial trends, and has not changed in years. That spendout rate means that on average, 45 percnt of a year's new funding will be outlayed during that year, and 55 percent will be carried over to the next year, generally as uncosted balances. (Another 35-40 percent of the appropriations will be spent in the second year, and the remaining 15-20 percent will be spent in the third year).

Thus, we expect, on average, to see uncosted balances that amount to 50 to 60 percent of the previous year's funding -- that is what is predicted by OMB and CBO spending models. The reasons for this particular spend-out rate may vary a bit from activity to activity, but in most competitively-awarded programs, there are necessary delays between appropriations, funding awards, and final spending. If we see an uncosted balanced that represents far in excess of the predicted 55 percent, that may signify a problem we need to investigate.

The Department's accounting system will not have the uncosted and unobligated data available for the period ending March 31, 1996 until late April. Accounting data from the end of February is the most current and this reflects $2,431,096 for operating expenses uncosted balances and $1,051,952 for operating expenses unobligated balances.

The uncosted balances for the Solar and Renewable programs are higher than some of the other programs in the Department because of two factors. First, the funding for most of these programs increased for seven years from FY 1989 through FY 1995, which consequently increased the uncosted obligations. Second, these programs are characterized by a very large number of relatively small projects, many of which have unique, business-oriented parameters associated with them. Much of the work is carried out directly by the private sector or in cost-shared partnership with private sector entities including the industries, states, universities, non-profit organizations, and others who utilize the technologies that are being jointly developing. This has proven to be a very successful approach to the achievement of the Solar and Renewable program mission requirements. It is easily understood that the accumulation of these encumbered yet still uncosted balances may be somewhat misleading. However, the amount of uncosted obligations is primarily a product of that working pattern. The time lines associated with the formulation of these partnerships are constrained by the legal requirements of federal procurement regulations and by the requirements of non-federal co-participants.

The work with universities is a good example of how the Solar Building Technologies Program is impacted by these business-oriented parameters and time lines. A total of $575,000 of the unobligated funds are committed to universities which are intentionally funded in the April-June time frame of any fiscal year. This allows universities to make financial commitments to faculty researchers, research staff, and graduate student research assistants in advance of an upcoming school year cycle.

The timing of Congressional budget appropriations cycle precludes funding a current school year cycle, because (a) funds are appropriated after the beginning of a current school year, (b) universities need to establish budgets and make financial commitments in the July-August time frame, and (c) the 3-6 month procedural time to award university contracts once funds are appropriated. The remaining unobligated funds are for industrial research partnerships which are intentionally funded on the same budget cycle as universities to assure close interaction and coordination of all contracted research and technical support activities by both universities and industry. The remaining obligated but uncosted balance of $1,379,144 reflects (a) approximately a 3 month lag for approximately $500,000 which have already been spent but which await actual payment of funds for those completed expenditures and (b) funds for labor and services for the remaining six months of FY 1996.

PHOTOVOLTAIC

Mr. Myers. The March 18, 1996 issue of Inside Energy reported that "DOE late last year awarded 11 grants for the fourth and final phase under the original program." This year, the budget includes an increase of $20,246,000 which "restores funding to the planned level in the Photovoltaic Manufacturing Technology (PVMaT) program, and restores DOE's commitment under PV-COMPACT." Will these new funds be used to pay existing grants or new grants?

Mrs. Ervin: Existing contracts require about $9.4M in FY 1997. Remaining funds will be used for new solicitations under these programs..

Mr. Myers. How many years does DOE anticipate this four year program will last?

Mrs. Ervin. The PVMaT initiative received its first appropriations in FY 1991. It was initiated as a 5-year, $110M (including industry cost-sharing) cooperative industry/DOE project. Because of its success in bringing down manufacturing costs very substantially and because of industries' identification of the manufacturing R&D area as its highest priority need, the project has been extended and continues to be a focal point for government support of the emerging U.S. photovoltaic industry. Continuation of the PVMaT project for an additional few years will help solidify the long-term competitive position of the U.S. photovoltaic industry in the rapidly-growing, large domestic and export markets.

Mr. Myers. Please provide a funding history for the PVMaT program from its inception through FY 1997.

Mrs. Ervin. A funding history for PVMatT follows:

PVMaT Funding History
($Millions)

FY91	FY92	FY93	FY94	FY95	FY96	FY97	Total
$6.6	$10.2	$10.9	$16.3	$10.7	$8.4	$13	$76.1

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $38,360,000, representing 46% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. The Department's accounting system does not have the uncosted and unobligated data available for the period ending March 31 therefore we are providing end of February information which is $40,676,831 for operating expenses uncosted balances and $25,765,586 for operating expenses unobligated balances.

The uncosted balances for the Photovoltaics program, as well as other Renewable programs, are primarily a result of the programmatic emphasis on cost-shared contracting

with industry and the procedural requirements, complexities, and time lines associated with the federal procurement process. These programs are characterized by a very large number of relatively small competitivly procured contracts with the private sector, most of which have unique business oriented parameters. When combined with the time and legal requirements of the federal procurement regulations, the time lines assocated with the competitive procurement process generally preclude awards during the the appropriations year that the the process is initiated. Once a contract award is made, costs are not reflected until the Department receives and processes periodic invoices submitted for work completed under the contract. The invoicing process can stretch over several years in the case of multi-year contracts. The accumulation of these obligated, but still uncosted balances is a natural result of the procurement and contract administration process.

SOLAR THERMAL ENERGY SYSTEMS

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $19,124,000, representing 63% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Ms. Ervin. Since the Department's accounting system does not have the uncosted and unobligated data available for the period ending March 31, 1996, we are providing you with the most current information. As of the end of February, there is a total of $19,172,657 for operating expenses uncosted balances and $4,852,184 for operating expenses unobligated balances.

The uncosted balances for the Solar Thermal Energy Systems program, as well as other Renewable programs, are primarily a result of the programmatic emphasis on cost-shared contracting with industry and the procedural requirements, complexities, and time lines associated with the federal procurement process. These programs are characterized by a very large number of relatively small competitivly procured contracts with the private sector, most of which have unique business oriented parameters. When combined with the time and legal requirements of the federal procurement regulations, the time lines assocated with the competitive procurement process generally preclude awards during the the appropriations year that the the process is initiated. Once a contract award is made, costs are not reflected until the Department receives and processes periodic invoices submitted for work completed under the contract. The invoicing process can stretch over several years in the case of multi-year contracts. The accumulation of these obligated, but still uncosted balances is a natural result of the procurement and contract administration process.

Mr. Myers: Please provide a summary of all construction-related funding in FY 1997 and over the last five years.

Mrs. Ervin. No construction funds have been appropriated over the last five years and none are requested for FY 1997.

Mr. Myers. For each of these years, provide the related cost share ratios with these projects.

Mrs. Ervin. As stated above, no solar thermal program construction funds were appropriated.

BIOFUELS ENERGY SYSTEMS

Mr. Myers. The request includes a $14.1 million increase for construction of 4-7 new projects. What is the anticipated total cost to complete these construction projects?

Ms. Ervin. The FY 1997 budget request for Biofuels Energy Systems does not include a construction line item. However, it is anticipated that the Biomass Power Program will move forward with up to six integrated biomass power projects as part of the collaborative DOE/USDA "Biomass Power for Rural Development" initiative. The total cost of these six projects is currently estimated to be $478M, with DOE providing $115M over six years.

Mr. Myers. Please provide a summary of all construction-related funding in FY 1997 and over the last five years.

Mrs. Ervin. No construction funds have been appropriated over the last five years and none are requested for FY 1997.
However, pilot plant construction has occured with funding from the research and development account.

Mr. Myers. For each of these years, provide the related cost-share ratios with these projects.

Mrs. Ervin. As stated above, no biomass program construction funds were appropriated.

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $36,848,000, representing 70% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. The end of February data is provided since the Department's accounting system does not have the uncosted and unobligated data available for the period ending March 31, 1996. The February data for the Biofuels Energy Systems includes $43,095,531 for operating expenses uncosted balances and $24,881,236 for operating expenses unobligated balances.

BIOFUELS ENERGY SYSTEMS

Mr. Myers. Last year, the Congress directed that $27,650,000 be provided for biochemical and thermochemical conversion. In her letter dated March 12, 1996, Secretary O'Leary stated that "We are in the process of ending thermochemical conversion research and development activities for producing liquid fuels." Please provide a detailed summary of funding allocations under this program showing funds allocated for biochemical and thermochemical conversion.

Ms. Ervin. The FY1996 funding allocation for thermochemical conversion research and development activities for producing liquid fuels is $1.77 million. These funds will be used to effectively close out liquid fuels thermochemical production activities. However, by reallocating resources and finding additional sources of funding from within the Department's other Solar and Renewable Energy programs, the thermochemical process development unit (TPDU) at the National Renewable Energy Laboratory is scheduled for completion this year. The TPDU will be offered as a user facility to potential industrial partners in various thermochemical industries including fuels, electric power production and chemicals. The FY1996 allocation for biochemical conversion research and development for production of liquid fuels is $19.61 million. At this level the Department is able to continue a balanced program of research, development, and demonstration activities for ethanol production.

Mr. Myers. Please provide funding allocations for the Regional Biomass Energy and feedstock programs which shows the source of these funds (power or ethanol).

Ms. Ervin.. The FY1996 funding allocation for the Regional Biomass Energy program is $3.81 million. The source of funds is neither the power nor the ethanol programs. The Regional Biomass program is a separate entity within Biofuels Energy Systems. As a result of a reorganization within the Department's Office of Energy Efficiency and Renewable Energy, administration of the program was recently transferred from Technical and Financial Assistance to the Biofuels - Transportation program. The funding allocation for the feedstock program is $5 million and is also administered by the Biofuels - Transportation program. The feedstock program is a key to the large-scale production of liquid fuels from biomass, but is also of benefit to all biomass energy applications, including electric power and chemicals.

WIND ENERGY SYSTEMS

Mr. Myers. It was recently reported that the Bergey Windpower Co. of Norman, Oklahoma signed a contract with Winrock International for 16 small wind turbines in eastern Indonesia under a program funded by the AID and the World Bank. How does the DOE cooperative Research and Testing program, for which an increase of $18 million was requested this year, differ from the existing AID/World Bank promotion program? What Commerce Dept. programs perform similar functions? What justification is there for so many different taxpayer-funded international promotion programs?

Mrs. Ervin. The DOE Cooperative Research and Testing program was funded at $6.3 million in FY 1996 and is seeking $8.2 million in FY 1997 request, an increase of $1.9 million. These activities focus on R&D prototype testing, at the National Wind Technology Center in CO, that allows the U.S. industry to verify new wind energy technologies. AID, World Bank, and other international groups provide assistance to countries, like Indonesia, for the deployment of commercial wind and other technologies overseas, after they have been tested. The Commerce Department performs no functions similar to our wind test program.

Mr. Myers. What Commerce Dept. programs perform similar functions?

Mrs. Ervin. The Commerce Department has overall responsibility for assisting U.S. firms compete more effectively in the global market place. Through its U.S. and Foreign Commercial Service it provides information on foreign markets, trade leads, trade barriers and prospects abroad. In providing assistance to the U.S. renewable energy industries, the Commerce Department participates in the Committee on Renewable Energy Commerce and Trade (CORECT), managed by this Department, along with twelve other federal agencies. CORECT coordinates all federal activities relating to the export of renewable energy technologies, thus avoiding unnecessary duplication, and has been in existence since 1984. Further, CORECT activities are reported to the Commerce Department's Trade Promotion Coordinating Committee (TPCC) which tracks all export assistance efforts throughout the government.

Mr. Myers. What justification is there for so many different taxpayer-funded international promotion programs?

Mrs. Ervin. The Committee on Renewable Energy Commerce and Trade (CORECT) provides a meaningful vehicle for the fourteen federal agency members to coordinate their export efforts. CORECT also provides the U.S. renewable energy industry a means to communicate directly to the member agencies and to participate in the development and implementation of export policy. The Trade Promotion Coordinating Committee (TPCC) tracks the government wide export picture. Thus, CORECT provides an industry focused export effort which is then coordinated at the government wide level by the TPCC. These two organizations help U.S. industry meet the highly coordinated export efforts of its foreign competitors.

Mr. Myers. This year's budget justification describes functions under technology deployment including construction and Climate Change Action Plan activities. Congress did not fund this account in FY 1996. How much was spent on these activities and what was the source of these funds?

Mrs. Ervin. Approximately 1.8 million dollars in funds appropriated in FY 1994 are funding the Department's share of the 6 MW Turbine Verification Project with Green Mountain Power Company in southern Vermont. The balance of the funding, approximately $9.8 million is coming from Green Mountain Power and the Electric Power Research Institute. The National Renewable Energy Laboratory is now negotiating about 60 MW of wind deployment projects with three host utilities and two turbine manufacturers. Funding for these projects was provided in the FY 1995 Appropriation.

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $41,742,000, representing 93% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. The requested information for the Wind Energy program is from the Department's February accounting reports and which reflects $46,751,097 for operating expenses uncosted balances and $13,084,490 for operating expenses unobligated balances.

The uncosted balances for the Photovoltaics program, as well as other Renewable programs, are primarily a result of the programmatic emphasis on cost-shared contracting with industry and the procedural requirements, complexities, and time lines associated with the federal procurement process. These programs are characterized by a very large number of relatively small competitivly procured contracts with the private sector, most of which have unique business oriented parameters. When combined with the time and legal requirements of the federal procurement regulations, the time lines assocated with the competitive procurement process generally preclude awards during the the appropriations year that the the process is initiated. Once a contract award is made, costs are not reflected until the Department receives and processes periodic invoices submitted for work completed under the contract. The invoicing process can stretch over several years in the case of multi-year contracts. The accumulation of these obligated, but still uncosted balances is a natural result of the procurement and contract administration process.

Mr. Myers. Please provide a summary of all construction-related funding in FY 1997 and over the last five years.

Mrs. Ervin. No construction funds have been appropriated over the last five years and none hare requested in FY

Mr. Myers. For each of these years, provide the related cost-share ratios with these projects.

Mrs. Ervin. As stated above, no wind program construction funds were appropriated.

ELECTRIC ENERGY SYSTEMS AND STORAGE

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $19,124,000, representing 63% of the amount provided in FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. The end of February data is provided since the Department's accounting system does not have the uncosted and unobligated data available for the period ending March 31, 1996. The February data includes $31,073,650 for operating expenses uncosted balances and $19,505,315 for operating expenses unobligated balances.

Mr. Meyers. Please provide a summary of all construction-related funding in FY 1997 and over the last five years.

Mrs. Ervin. No construction funds have been appropriated over the last five years and none are requested for FY 1997.

Mr. Meyers. For each of these years, provide the related cost share ratios with these projects.

Mrs. Ervin. As stated above, no program construction funds were appropriated.

NATIONAL RENEWABLE ENERGY LABORATORY

Mr. Myers. Please provide the total uncosted and unobligated balances for NREL at the end of FY 1995.

Ms. Ervin. The FY 1995 year end uncosted balance for the NREL including construction, general plant projects, and general purpose equipment is $8,507,000.

Mr. Myers. Also, for the record, please provide the total uncosted and unobligated balance as of March 31, 1996.

Ms. Ervin. The uncosted balances at the end of February are $7,582,772 and the unobligated balances are $1,866.

Mr. Myers. The Solar Industry Journal recently reported that NREL is providing $850,000, in addition to prior federal funds, to build a photovoltaic manufacturing plant in Moscow. What is the total amount of funding, including all federal funds, for this project to date?

Ms. Ervin. Before the dramatic breakup of the Soviet Union, the U.S.'s Energy Conversion Devices (EDC), Inc., entered into a joint venture with the Soviet government's KVANT industrial group in 1990 to design, build, and operate a 2 megawatt, triple-junction, amorphous silicon manufacturing facility in Russia. This Soviet-American joint venture, called Sovlux, is owned 50% by each partner and was established to manufacture ECD's proprietary PV solar products in the Soviet Union. Following the breakup of the Soviet Union, there was a period of turmoil during which the joint venture and the manufacturing plant were not active. In the interlude, a 2 megawatt manufacturing facility was designed, built, and operated by ECD in Troy, MI. This equipment was shipped to Russia in about 1993, and ECD, Inc., received $8.7M in a cash payment from KVANT for delivery of the manufacturing facility. However, the joint venture manufacturing operations being managed by KVANT, now under the jurisdiction of the Russia, was unable to get the facility into reliable operation. KVANT and ECD requested assistance from the U.S. Industry Coalition (USIC), managed by Sandia Laboratories for the U.S. Department of Defense (DOD), to upgrade and startup a reliable manufacturing operation.

The U.S. Industry Coalition (USIC) decided to assist Russia's KVANT in this project to startup commercial manufacturing in this new facility. NREL has been assisting the Sandia Laboratories USIC program in the implementation of this project. In this management role, NREL awarded a $550K contract to the Russian government company, KVANT, in June, 1995, to assist in the upgrading and startup operations of the new manufacturing facility. Further, NREL and ECD have been cooperating in technical and management activities directed to improving the facilities and training the Russian workforce. Another $200K is now needed to complete the project, making it a total investment of $750K by the USIC program.

Mr. Myers. What is the status of this plant?

Mrs. Ervin. The plant has produced some pre-commercial runs and showed good yield (90-97%) of efficient subcells (9.5-10.2% initial). More than 40 4 ft^2 modules were assembled using the subcells. The effort is now to introduce Russian made materials into the production line.

Mr. Myers. Does this plant manufacture a product similar to American-manufactured product?

Ms. Ervin. Yes. Currently some of the amorphous silicon PV module material being manufactured in Russia by the KVANT/ECD joint venture, SOVLUX, is being shipped to ECD, Inc., in Troy, MI, to accelerate ECD's development of PV roof shingle products in the U.S. In Troy, ECD is engineering this material into prototype roof shingle products for early tests and demonstrations. In parallel with these activities, ECD, Inc., has recently completed the construction and startup of an advanced 5 megawatt manufacturing plant in Troy, MI. This new plant will produce the next generation of amorphous silicon modules for power applications as well as for PV roof shingle products. The development of commercial roofing shingle products by ECD, Inc., in the U.S. is expected to result in manufacturing plants and large markets in both countries. ECD's chief role in the Russia joint venture is to license its proprietary products and help KVANT manufacture and market in Europe. The benefit that will accrue to the U.S. in the Russian-made products will be through the 50% ownership of SOVLUX and the expected huge market in Russian for photovoltaic modules and roof shingles.

RESOURCE ASSESSMENT

Mr. Myers. What "close out " costs are anticipated in FY 1997?

Mrs. Ervin. We estimate $300,000 will be required for program "close out".

Mr. Myers. What will be the source of these funds?

Mrs. Ervin. These funds will be obtained from FY 1996 carryover.

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $1,146,000, representing 59% of the amount provided in FY 1996. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. The requested information for the Resource Assessment program is from the Department's February accounting reports. The amount for operating expenses uncosted balances is $1,487,955 and the amount for operating expenses unobligated balances is $550,056.

SOLAR AND RENEWABLE ENERGY DEPLOYMENT

Mr. Myers. Provide details on funding the Commercialization Ventures program.

Mrs. Ervin. The program is designed to assist new viable renewable technologies overcome financing and perception based barriers and enter the marketplace. In FY 1994, a project solicitation was issued which resulted in the selection of five cost-shared projects. In FY 1995, no project solicitation was issued, but rather programmatic efforts were focused on obtaining the services of a financial advisor to assist the Department in providing financial and market oriented information. In FY 1996, a project solicitation will be issued with the goal of selecting an additional 5 to 10 projects for cost-shared funding. In FY 1997, the program will utilize the services of its financial advisor to assist individuals and firms with emerging products and services improve their business plans and similar project packaging in order to attract private sector funding. No cost-shared projects will be funded in FY 1997.

Mr. Myers. What are the criteria for selecting the business/entrepreneurs?

Mrs. Ervin: The criteria for selecting the businesses or entrepreneurs are those indicated in the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (P.L. 101-218), as amended by the Energy Policy Act of 1992 (Sections 1201-1202)(P.L.102-486). A business or entrepreneur seeking financial assistance must provide at least 50% of the project funding from non-federal sources; manufacture and reproduction must be substantially within the U.S.; and the project must include at least one for-profit partner. Selection of projects for financial assistance is based upon the projects compliance with the legislative requirements, the need for federal assistance shown, and the projects' potential for success.

Mr. Myers. What is the range of funding for these awards?

Mrs. Ervin. Funding for the five projects selected range from $200,000 to $3,500,000.

Mr. Myers. What is the cost share?

Mrs. Ervin. Of the five projects selected, one project has a cost share of 60% non-federal funds to 40% federal funds. The remaining projects are at the 50/50 non-federal/federal cost-share.

Mr. Myers. What activities in Chile, Argentina and Brazil are to be curtailed in FY 1996 due to decreased funding?

Mrs. Ervin. In FY 1996, no funds were received for the Americas' 21st Century program which focuses on the Latin American region. Additional rural electrification projects which had been planned for Chile, Argentina and Brazil were not pursued and prior year funds were used to complete those projects already undertaken.

Mr. Myers. Please itemize the $1.3 million request for Information and communications.

Mrs. Ervin. Of the $1.3 million requested in FY 1997 for Information and communications, $1,010,000 will be used to support EREC (Energy Efficiency and Renewable Energy Clearinghouse) and $350,000 will support TIP (Technical Information Program).

Mr. Myers. Please describe the TIP program, including authorizing history, anticipated costs, program goals and a summary of prior year funding.

Mrs. Ervin. TIP develops and produces technology transfer products on renewable energy and energy efficiency including: brochures, technology fact sheets, videos, exhibits, and multimedia presentations. The Department has funded TIP since 1981 (when it was known as the Solar Technical Information Program). Recent funding has been: FY 1994 $800,000, FY 1995 $930,000, and FY 1996 $350,000. The goal of TIP is to provide factual technical information to decision makers at the federal, state, and local levels, as well as members of the industrial, utility, transportation, and buildings communities. The materials prepared by TIP show practical ways in which using EERE technologies can reduce energy consumption, save money and create jobs.

Mr. Myers. Please provide a copy of each product produced for the Cities and Counties Campaign.

Mrs. Ervin. Attached is a copy of Tomorrow's Energy Today - Energy Solutions for Cities and Counties.

Mr. Myers. Please provide a description of the Tribal Grants program including the purpose of the grants, the recipients and the amounts provided.

Mrs. Ervin. The Tribal Grants program was established by the Energy Policy Act of 1992 to help implement renewable energy projects on Native American lands. The program grew out of the belief that each generation must provide for the generations that follow it. In FY 94 and FY 95, 35 grants totaling $6.5 million were awarded to 29 tribes and Alaskan native corporations in 13 states. Projects included photovoltaic water pumping systems for drinking water and ranches; biomass electricity and steam generation using logging and mill waste; wind energy generation; and the construction of super-efficient homes and community buildings.

Mr. Myers. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. At the end of February the Department's accounting system reflects $3,397,826 for operating expenses uncosted balances and $2,000,000 for operating expenses unobligated balances for Tribal Grants.

Mr. Myers. At the end of FY 1995, the two programs now included in Solar and Renewable Energy Deployment, International Solar Energy and Solar Technology Transfer had accumulated uncosted balances totaling $33,231,000, representing 102% of the amount available at the start of FY 1995. For the record, please provide the total uncosted and unobligated balances as of March 31, 1996.

Mrs. Ervin. I am again responding with data from the Department's February accounting reports because it is the most current information. The amount for operating expenses uncosted balances is $28,009,228 and the amount for operating expenses unobligated balances is $7,608,304.

The uncosted balances for the Solar and Renewable Energy Deployment program, as well as other Renewable programs, are primarily a result of the programmatic emphasis on cost-shared contracting with industry and the procedural requirements, complexities, and time lines associated with the federal procurement process. These programs are characterized by a very large number of relatively small competitivly procured contracts with the private sector, most of which have unique business oriented parameters. When combined with the time and legal requirements of the federal procurement regulations, the time lines assocated with the competitive procurement process generally preclude awards during the the appropriations year that the the process is initiated. Once a contract award is made, costs are not reflected until the Department receives and processes periodic invoices submitted for work completed under the contract. The invoicing process can stretch over several years in the case of multi-year contracts. The accumulation of these obligated, but still uncosted balances is a natural result of the procurement and contract administration process.

GEOTHERMAL

Mr. Myers. In FY 1996 and FY 1997, DOE intends to spend $11.8 million on its heat pump program. Please provide a detailed description of this program including details on where the funds are being spent, what cost-sharing is being done, DOE goals and whether performance goals are being met.

Mrs. Ervin. Through the auspices of the Edison Electric Institute (EEI), 120 utilities, plus the geothermal heat pump industry, DOE, and EPA established the Geothermal Heat Pump Consortium (GHPC) in November 1994. GHPC membership includes the majority of the nation's electric utility customers and 8 of the nation's largest utilities. The utility industry has stated that without DOE support this major energy saving and emission reduction program would not have been launched. DOE's initial objective of achieving major utility support for the GHPC has been met.

GHPC's goal, shared by DOE, is to achieve annual sales to 400,000 units by the year 2000. The interim goal for 1995, established in 1993, was annual sales of 55,000 GHPs and according to the best industry sources has been met.

The initial emphasis of the GHPC program is to benchmark and determine best practices for GHP design, installation, and marketing for both residential and commercial buildings. Additional tasks, including collection and analysis of energy use and system maintenance data, GHP design assistance, and installation R&D, are being conducted by Oak Ridge National Laboratory, the American Society of Heating, Refrigeration, and Air Conditioning Engineers, the International Ground Heat Pump Association, and Sandia National Laboratories. The GHPC receives the majority of funds (60%+) with the balance shared among the above participants. The overall program cost is $100 million over six years with DOE investing a total of $35 million. The cost-sharing ratio with the GHP industry is about 1:1 in FY 1996 and will approach industry 2:federal 1 in FY 1997. Jointly funded pilot and demonstration projects begun over the past year involve a number of utilities: Duke Power (residential), Detroit Edison (residential and commercial), Minnesota Power (small commercial), Virginia Power (state owned buildings), Kansas City Power and Light (residential), Pennsylvania Power & Light (residential), Plumas-Sierra Rural Electric Cooperative (condominiums), and Northeast Utilities (residential).

Mr. Myers. Since two of the challenges facing the geothermal program are so closely related to fossil fuel extraction--exploration and drilling technology, what effort has been made to work with the oil and gas industries?

Mrs. Ervin. The Office of Geothermal Technologies has historically worked closely with the oil and gas industries to reduce drilling and exploration costs. For example, the Office of Geothermal Technologies and Fossil Energy Office jointly fund research on polycrystalline diamond compact (PDC) drilling bits. The overall DOE investment in this technology was $7.5 million over about a decade. The PDC bit sales by U.S. manufacturers over a ten year period from 1982 to 1992 were over $800 million, and the drilling cost savings in the United States due to the PDC bits are estimated at about $700 million.

The Office of Geothermal Technologies and Fossil Energy Office are currently jointly funding a renewed research effort to improve the hard rock drilling capabilities of the PDC bit. A renewed effort has been underway since FY 1994 to improve the hard-rock drilling capabilities of the PDC bit. This is an industry cost-shared program with four companies: Dennis Tool Company, Security DBS, Hughes Christensen Company, and Maurer Engineering/SlimDril International. In addition, the Geothermal and Fossil Energy programs cosponsored several evaluation studies of advanced drilling technologies. The two offices continue to look for other areas of common interest where collaborative efforts will better serve their program goals.

Mr. Myers. Please provide the status of the Lake County/Geysers project.

Mrs. Ervin. Final design of the majority of the Lake County/Geysers project has been completed and Lake County Sanitation District, the project manager, awarded a number of contracts in March 1996 for pipeline and pump station construction. Construction is underway and will continue into 1997.

Mr. Myers. How much has been obligated?

Mrs. Ervin. The Department has obligated $5.4 million to the Lake County/Geysers project from FY 1993 through FY 1996.

Mr. Myers. What amount is available for obligation?

Mrs. Ervin. In FY 1997, $2 million is planned for obligation.

Mr. Myers. What is the estimate of the total cost?

Mrs. Ervin. According to the Lake County Sanitation District, the total cost of the Lake County/Geysers project will be $45 million. This includes the DOE share of $7.4 million.

Mr. Myers. What is the schedule?

Mrs. Ervin. Ground breaking for the Lake County/Geysers project occurred in October 1995. Construction is ongoing and will continue into 1997. Operation of the pipeline is anticipated to begin in August or September 1997.

Mr. Myers. What is the most recent estimate of uncosted and unobligated balances in this account?

Mrs. Ervin. The most recent estimates of uncosted and unobligated balances for the Hydrogen program are $4,153,475 for uncosted balances and $7,611,698 for unobligated balances at the end of February.

HYDROGEN ENERGY

Mr. Myers. The budget justification states that the decrease in FY 1997 will eliminate cost-shared industrial R&D, then states that the FY 1998 goal is complete installation of three hydrogen producing or hydrogen fueled systems. Last year, the Committee directed that $250,000 be provided to an institution with expertise in electro-chemical (fuel cells), thermochemical and photochemical reactions for hydrogen production. What is the status of this research?

Mrs. Ervin. The statement in the FY 1997 budget request concerning elimination of the cost-shared industrial R&D programs deals specifically with technology verification activities for near-term production and end-use technologies. As noted, the effort for the FY1998 goal is the completed the installation of three longer-term hydrogen-production/hydrogen-fueled systems. These efforts are part of the program's longer-term efforts.

For the electro-chemical (fuel cells), thermochemical and photochemical activities, two proposals were received from institutions that had the appropriate expertise in FY 1995 One proposal was selected for funding. This institution was the Florida Solar Energy Center. The research has been under contract for nine months and will be technically reviewed at the Hydrogen Program Annual Peer Review in May.

HYDROPOWER

Mr. Myers. DOE folded hydropower into the geothermal program. Why?

Mrs. Ervin. This administrative move consolidates the hydropower program with other programs executed through its Idaho Operations Office resulting in improved Headquarters operational efficiency and reduced costs.

Mr. Myers. Please let us know the amount of funds for hydropower in FY 1996 and FY 1997.

Mrs. Ervin. In FY 1996 $1.5 million was appropriated for hydropower development (CE-10) and $2.0 million for the Haida (Alaska) Hydropower Project under the Indian Energy Resources Program (EN-03). DOE is requesting, under the geothermal program, $1.0 million for FY 1997.

Mr. Myers. At the end of FY 1995, this program had accumulated an uncosted balance of $4,929,000 representing 102% of the amount provided in FY 1995. What is the most recent estimate of uncosted and unobligated funds for hydropower?

Mrs. Ervin. The most recent estimates of uncosted and unobligated balances for the Hydropower program are $1,018,323 for uncosted balances and $1,019,113 for unobligated balances at the end of February. Our records show that the uncosted balances for the Hydropower program were $1,531,077.

Mr. Myers. What is the status of the Tazimina hydroelectric project?

Mrs. Ervin. DOE issued a grant to the State of Alaska in July 1995 for the Tazimina project. The project was granted a license exemption from the Federal Energy Regulatory Commission in September 1995, and construction is scheduled to begin this spring.

Mr. Myers. Please provide the status of the EMF program.

Mrs. Ervin. The Electric and Magnetic Field (EMF) Research and Public Information Dissemination (RAPID) program continues on target with both planned and mandated activities. Earlier this year, a comprehensive progress report for this program was delivered to Congress. There has been vigorous support from non-federal stakeholders who have committed more than $23 million over the five years of the program. A robust health research program is under way, managed by our federal partner in this program - the National Institute of Environmental Health Sciences. The National Academy of Science completed its first review of this program last September and expressed support for the planned research strategy. The program's first public EMF information booklet has been distributed to more than 100,000 interested people and thousands more have found it on the Internet.

In addition, the Department's biomechanism research continues its systematic research on cells, animals, and humans. The focus of this program is to determine the possible mechanisms by which fields interact with biological entities and to discover how these effects depend on field parameters such as intensity, frequency, and intermittency. The two program components are fully complementary and work in close cooperation to prepare the scientific basis for a planned EMF risk assessment by the National Institute of Environmental Health Sciences.

Mr. Myers. Please provide more information about the RGS system, the hybrid storage/renewable system at Sacramento Municipal Utility District and the Transportable Battery Energy Storage System. Please include goals, performance measures, partners, timetables, cost-share ratios, uncosted balances.

Mrs. Ervin. The Renewable-Generation-Storage systems will integrate storage with renewables in a turn-key system which will provide utilities with improved reliability and greater dispatchability. This dependable, or "firm" power can then be sold at increased profits. The use of storage in conjunction with renewables generation is estimated to increase the market penetration levels of renewables by 20% in the year 2010. The goal is to provide utilities with cost-effective, turn-key "firm" renewable resources incorporating an appropriately sized and integrated storage system through a cost-shared project with industry. Partners in this R&D effort will be determined when the project is initiated. Cost sharing will be 70% by manufacturers and utilities. Initial plans call for the prototype turn-key modular integrated system will be delivered for test in FY 1999. Performance measures will include the preparation in FY 1996 of a detailed project plan for the Renewable-Generation-Storage activity. In FY 1997 the integrated system development project will be initiated. There are no uncosted or unobligated balances.

In partnership with Sacramento Municipal Utility District (SMUD), a design study is underway for a hybrid system combining storage with renewable generation which will significantly increase or "firm" the capacity credit assigned by the utility to the renewable resource because of the improved dispatchability and stability of the power. The goal is to determine the value of battery storage systems when used in combination with renewable resources such as wind and photovoltaics and develop specifications for such a system for the Sacramento Municipal Utility District, the partner.

Cost sharing will be 10%. The system design, economic analyses and specifications are scheduled to be finished by FY 1998. Performance measures will include completion by FY 1996 of the feasibility design study for a hybrid storage/renewable system at Sacramento Municipal Utility District, determining preliminary system economic benefit to cost ratio. In FY 1997, the economics and operational value of battery storage to the Solano wind plant and PV plant will be quantified. Appropriate storage system specifications will be developed for use by SMUD in procuring storage for these renewable resources.

The Transportable Battery Energy Storage System (TBESS) will provide 1 MW for 30 seconds to solve power quality problems in a transportable utility scale system. Transportability provides utility and industrial users significantly increased siting flexibility where the storage system can be located at a site that is experiencing power quality problems and then easily and inexpensively be moved to another site once the power quality disturbances are eliminated. This flexibility affords the utility the greatest economic value. The goal is to both develop and demonstrate a prototype TBESS by 1999. Partners in this effort will include a system supplier and utility. The program is coordinated with related activities pursued at EPRI. Cost sharing will be 30-50%. Performance measures will include completion by FY 1996 of the design for the TBESS. Utility host site testing of TBESS will begin in FY 1997. There are no uncosted or unobligated balances.

Golden Field Office

Mr. Myers. The average FTE cost between FY 1996 and FY 1997 increased by more than $9,000 per FTE. Please provide the specifics of the cost elements and associated costs for the two fiscal years.

Ms. Ervin. The cost for 22 FTEs at the Golden Field Office in FY 1996, including salary, benefits, and travel is $2,095,000. The total FY 1997 request for 16 FTEs is $1,675,000, which results in an average increase of $9,461 for each FTE, or a total increase of $151,376. The increase reflects $45,712 for Federal employee pay raise and $105,664 for estimated buyout costs of 4 FTEs.

Mr. Myers. Why was the average cost per FTE for travel for FY 1997 in excess of $14,000 per FTE?

Ms. Ervin. The average cost per FTE for travel is $13,636 in FY 1996 and $14,063 in FY 1997. The 3 percent increase is the estimated inflationary increase for travel in FY 1997.

Mr. Myers. Please provide a summary of the cost elements of the $1.0 million in the "Other Related Expenses" category.

Ms. Ervin. The $1,000,000 is requested to support $770,000 for rental payments for the Golden Field Office space and $35,000 for communications and utilities, $60,000 for printing and reproduction, $85,000 for supplies and materials, and $50,000 for support service requirements.

DOE Headquarters

Mr. Myers. The average FTE cost between FY 1996 and FY 1997 increased by more than $12,000 per FTE. Please provide the specifics of the cost elements and associated costs for the two fiscal years.

Ms. Ervin. The costs for 142 FTEs at Headquarters in FY 1996 includes salary and benefits costs of $11,731,000 and federal employee travel of $790,000 for an average of $88,176. The FY 1997 costs for 134 FTEs is $12,139,000 for salary and benefits and $681,000 for travel for an average of $99,380. The increase in the average costs of $11,204 includes an estimated $2,645 for pay raise, and $8,559 for overtime, compensatory time, and employee incentive awards.

IN-HOUSE ENERGY MANAGEMENT(IHEM)

Mr. Myers. Last year, the Committee eliminated this program. What activities (if any) werecontinued in FY 1996?

Ms. Ervin. There were no funds appropriated in FY 1996 by the Congress for the In-House Energy Management Program. The Department has eliminated new energy cost savings projects and IHEM related activities. The staff are providing close out of previously funded studies and projects, facilitating the use of energy savings performance contracting within the Department, and working with the Deputy Secretary's office and the DOE Programs to identify future energy management projects that can be accomplished through energy savings performance contracts.

Reducing the cost of operations by generating $700 million in energy management related savings over the next 10 years is crucial to meeting the Department's financial and energy savings goals. By managing its energy expenses there is a potential return on investment of 25 percent.

Toward that end the Department is in the process of developing a central procurement of energy efficient chillers along with other building energy conservation measures. This central procurement will use an energy savings performance contract and will greatly simplify the process of contracting for efficient chillers using private funding. Without these central activities, each site would be required to incur costs associated with contracting for its own chiller retrofit requirements. When this centralized procurement is in place, the Department will be able to avoid $200 million in chiller replacement costs, achieve energy cost savings and gain the environmental benefits of phasing out CFC use. It is likely to be the first of many central procurement for energy efficiency and renewable energy measures.

This type of centralized energy management activity along with the centralized reporting of annual energy use and management of ongoing energy projects funded prior to FY 96 are the activities that will ensure that the Department can deliver the $700 million in savings in the next 10 years. Funds requested in FY 1997 will continue these efforts and help to reduce the $60 million on outstanding cost savings projects that have been identified in previous years but remain unfunded. Funding will also help to identify the best opportunities for implementing additional procurement as well as supporting the best projects which offer greater savings from direct Federal investments than can be achieved with the use of private financing.

Mr. Myers. What was the source of the funds to continue these activities?

Ms. Ervin. The source of funds to continue the In-House Energy Management activities is from the Solar and Renewable, Policy and Management account. The Department determined that this was the most appropriate account to fund activities which will lead to $700 million in Departmental savings from the expanded use of energy efficiency, solar and renewable technologies at DOE facilities.

GENERAL

Mr. Myers. The International Institute for Energy Conservation and the Amercian Council for an Energy-Efficient Economy are two non-federal groups that promote energy efficiency. Please provide a list of groups, including these two, and a brief narrative describing the activities of the groups.

Ms. Ervin. The International Institute for Energy Conservation is a non-profit organization focused n catalyzing energy efficiency in developing countries. They have three offices overseas, in Latin American, Asia and Eastern Europe.

The Alliance to Save Energy is a non-profit coalition of businesses, government, environmental and consumer leaders, promoting the efficient use of energy in order to strengthen America's economy, improve the environment, help consumers and enhance national security.

The American Council for an Energy Efficient Economy is a non-profit organzation dedicated to advancing energy efficieny as a means for promoting both economic prosperity and environmental protection. They do in-depth technical and policy assessments, advise governments and utilities, publish books, conference proceedings and reports, organize conferences, and inform customers.

RUSSIAN REPLACEMENT POWER INITIATIVE

Mr. Myers. The FY 1996 request for this program was $5,000,000. The Committee refused to fund this program last year. This year's budget justification reveals that this program was funded by the Department Of State, Office of Nonproliferation and National Security, International Cooperation, and prior year funds. When was the decision made to provide this funding despite the Committee's clear language that no funds were included for this program?

Dr. Lash. In June 1995, the Gore-Chernomyrdin Commission agreed to examine the possibility of converting the fuel in Russia's three plutonium production reactors so that they continue to produce essential heat and electricity for the region while no longer producing weapons-grade plutonium. The Commission also agreed to study the option of replacing the production reactors with new nuclear power plants. In August, 1995, the Department provided $3 million for feasibility studies, which were considered to be within our operational discretion. These studies did not commit the Department to funding the Russian Replacement Power Initiative in FY 1996, in accordance with Congressional guidance." The feasibility studies for these options were completed in December 1995.

RUSSIAN REPLACEMENT POWER INITIATIVE

Mr. Myers. Who made this decision: Please provide information that will help reconstruct the decision-making in locating and securing funds from within DOE and from the Dept. of State.

Dr. Lash. In June 1995, the Gore-Chernomyrdin Commission agreed to examine the possibility of converting the fuel in Russia's three plutonium production reactors so that they continue to produce essential heat and electricity for the region while no longer producing weapons-grade plutonium. The Commission also agreed to study the option of replacing the production reactors with new nuclear power plants. In August, 1995, the Department provided $3 million for feasibility studies, which were considered to be within our operational discretion. Funding arrangements involved senior Department officials including those in the Offices of Nuclear Energy, Science and Technology, Chief Financial Officer, and Nonproliferation and National Security." The feasibility studies for these options were completed in December 1995. Securing funds from the State Department is in accordance with Congressional guidance that this program would be more appropriately funded out of a foreign assistance program.

RUSSIAN REPLACEMENT POWER INITIATIVE

Mr. Myers. Was any consideration given to informing the Committee and/or the Congress about funding this new program?

Dr. Lash. The FY 1996 budget request briefly described our FY 1995 initiation of feasibility studies as part of our request for a formal program to continue the next phase of effort. Because the feasibility studies, funded by the Offices of Nonproliferation and National Security and the Nuclear Energy, Science and Technology, were within the operational discretion of these accounts, a reprogramming was not considered.

AP-600 REACTOR

Mr. Myers. China has repeatedly spurned U.S. efforts to stop selling nuclear reactors to Iran and Pakistan. Why has DOE invited Chinese technicians to participate in and have access to development activities of the AP600 reactor?

Mr. Northaus. The decision by DOE to permit Westinghouse to invite six Chinese engineers to Pittsburgh to work on the Westinghouse AP600 development program is consistent with the Administration's support for the development of peaceful nuclear cooperation with China. Indeed, the visit is being conducted under an authorization under section 57 b.(2) of the Atomic Energy Act of 1954 issued by DOE to Westinghouse in 1985, an authorization which permits provision of a broad array of technical assistance to the Chinese nuclear power program.

The Administration does have concerns with respect to China's nuclear cooperation with Pakistan and Iran. In the case of Iran, we are concerned that Chinese support for Iran's safeguarded nuclear program could help build an infrastructure that could support Iran's acquisition of nuclear explosives. In the case of Pakistan, we have long had concerns over Chinese assistance to Pakistan's unsafeguarded nuclear program.

We have raised both of these concerns with China directly and are pursuing every opportunity to make clear our concerns regarding Chinese nuclear cooperation with third countries.

FISCAL YEAR 1997 BUDGET REQUEST

Mr. Myers. When did federal funding for the SBWR begin?

Dr. Lash. The DOE has sponsored two SBWR programs. In 1986, a cost-shared program was initiated for the design and developmental testing of SBWR passive safety features. In 1990, a new cost-shared program was initiated to obtain Nuclear Regulatory Commission design certification for the SBWR.

FISCAL YEAR 1997 BUDGET REQUEST

Mr. Myers. What is the total federal funding for SBWR to date?

Dr. Lash. The Department provided $10.8 million to design and test SBWR passive safety features. This amount was matched by industry partners. The DOE spent $48.8 million on the design certification program. This amount was matched by $120 million in industry contributions.

FISCAL YEAR 1997 BUDGET REQUEST FOR THE GE SBWR

Mr. Myers. What is the funding level included in the FY 1997 budget?

Dr. Lash. The Department is evaluating its options on continuing activities with the General Electric (GE) Simplified Boiling Water Reactor (SBWR). In the near future, follow-on meetings with DOE, U.S. utilities, and GE will be held to make a final decision on SBWR program activities, funding, etc. There will be no funding provided in fiscal year 1997 by the Department.

FISCAL YEAR 1997 BUDGET REQUEST

Mr. Myers. Please provide uncosted and unobligated balances as of March 31, 1996.

Dr. Lash. Initially $1,500,000 of FY 1996 DOE funds were allocated for the SBWR program. Of this amount, through March 31, 1996, $435,000 has been obligated and costed. An additional $11,000 remains to be obligated to reach the current contractual limit in the DOE-GE SBWR contract. The remaining $1,054 was planned to be added to the contract through a contractual modification. However, with the press announcement by GE to suspend certification of the SBWR, DOE does not now plan to either process the contract modification or obligate the additional funds. These funds may be reallocated to other priority light water reactor activities, after further discussion with GE.

ATR FUSION IRRADIATIONS

Mr. Myers. What is the status of the irradiation test assembly?

Dr. Lash. In accordance with an agreement between the Office of Nuclear Energy, Science and Technology (NE) and the Office of Energy Research (ER), NE is to fund the design, fabrication and installation of a test vehicle in the Advanced Test Reactor (ATR) for Fusion Program materials irradiation experiments. All irradiations and experiments using the vehicle are to be funded by ER.

Consistent with schedule changes in the ER fusion program, work on the Advanced Test Reactor fusion irradiation test vehicle was suspended in FY 1996, the design is 90 percent complete, and some materials for the actual fabrication of the test vehicle have been procured and will be stored until the project resumes in FY 1997. The test vehicle is planned to be completed in FY 1998, at which time the irradiation program will begin.

ATR FUSION IRRADIATIONS

Mr. Myers. What funds are available to be carried forward?

Dr. Lash. There are no funds available to be carried forward.

ATR FUSION IRRADIATIONS

Mr. Myers. What is the estimated total cost for this program in FY 1996 and 1997?

Dr. Lash. The planned cost for this program in FY 1996 and FY 1997 was $2.3 million and $800,000 respectively. However, in FY 1996, only $900,000 is being spent on the program; the other $1.4 million has been used to offset a congressionally-mandated general reduction. The design, fabrication and installation of the test assembly will continue in FY 1997 and be completed in FY 1998. Planned funding is $800,000 in FY 1997 and $1.7 million in FY 1998.

OAK RIDGE LANDLORD

Mr. Myers. The request for FY 1997 includes $1.6 million increase which, in part, is described as necessary for certain seismic upgrades at the water plant in Oak Ridge to resolve "seismic stability problems." Describe the nature of the problem(s) and provide the specifics of the requirement which drives the necessity for the upgrade.

Dr. Lash. The latest budget estimate for the "slope stability" project at the water plant is $1.4 million. The existing earth slope, which supports the 4 million gallon reservoir at the water plant, has been seismically surveyed and determined to be unstable even during static conditions with no seismic activity. The project survey and design are complete and Oak Ridge Operations Office management is committed to solving the serious deficiency. The water plant is located on the top of a ridgeline which overlooks the Y-12 plant. Any soil instability could cause a catastrophic failure of the reservoir. This instability currently exists. If the reservoir fails, 40 percent of the water plant's storage capacity would be eliminated and a safety problem would ensue as the water from the reservoir poured down the ridge and across Bear Creek Road towards the Y-12 plant. Anyone on Bear Creek Road during such an event would be in jeopardy.

Mr. Myers. Also, provide the funding requirement for FY 1997 and indicate whether this estimate completes the work or whether there is a future year associated mortgage.

Dr. Lash. If fully funded at the requested $1.4 million level, the project could be initiated after construction bids are taken. Upon completion, the new retaining wall would satisfy the deficiency and no future year capital funding would be necessary. Minimal operating funding would be necessary for maintenance (this would come from OR Landlord operating funds).

OAK RIDGE LANDLORD

Mr. Myers. How much of the FY 1996 requested increase was for the accounting consolidation requirement and what were the specific requirements? There is no mention in the budget materials of this initiative.

Dr. Lash. A portion of the general reduction was applied to the landlord budget, therefore there was no increase from FY 1995 to FY 1996. The following amounts were spent out of the landlord budget for the accounting consolidation activities:

	FY 1996 ($ in thousands)
Support Service Contractors	$500
Software	200
Total	$700

OAK RIDGE LANDLORD

Mr. Myers. If funding is requested for the Financial Center in FY 1997, please provide the specifics of the requirements.

Dr. Lash. Funding for the Financial Center for FY 1997 is as follows:

	($ in thousands)
Support Service Contractors	$525
Equipment (Computers, software)	140
Supplies	20
Payment processing	215
Total	$900

OAK RIDGE LANDLORD

Mr. Myers. With regard to litigation expenses and the related legacy of those claims, would it not be proper for the legacy program (if the program remains a viable operating program) to be assuming the cost of litigation associated with the prior program actions/activities which have caused the attendant litigation? Please elaborate in sufficient detail to give understanding as to why this is a landlord activity.

Dr. Lash. The Department has funded litigation related expenses from program budgets. However, because litigation often cannot be attributed to one particular program, it is difficult to allocate among various programs. Beginning in FY 1994, the Chief Financial Officer instructed that this activity be budgeted in the Oak Ridge Landlord account.

OAK RIDGE LANDLORD

Mr. Myers. Provide a breakdown of the FY 1997 request to show the resources allocated to (1) the Museum, (2) the Emergency Operations Center, (3) maintenance of roads/grounds, (4) litigation, (5) Financial Center, (6) payment in lieu of taxes, (7) all other.

Dr. Lash. A breakdown of the FY 1997 request is shown in a table that I would like to insert for the record.

	($ in million)
Museum	1.7
Emergency Operations Center	1.2
Maintenance of roads/grounds	1.3
Litigation	0.2
Financial Center	0.9
Payment-in-lieu of taxes	3.5
All other	7.2
Total Oak Ridge Landlord	16.0

UNIVERSITY REACTOR FUEL ASSISTANCE AND SUPPORT

Mr. Myers. What is the latest estimate of FY 1996 funding for this program?

Dr. Lash. Our planned expenditure for this activity in FY 1996 is $4.5 million. These funds are used to support the fuel assistance program, Nuclear Energy's Historically Black College and University activities and the Nuclear Engineering and Health Physics Fellowship effort.

UNIVERSITY REACTOR FUEL ASSISTANCE AND SUPPORT

Mr. Myers. What is the source of these funds?

Dr. Lash. Congress appropriated $3.5 million for the University Nuclear Science and Reactor Support program for FY 1996. The specific elements of this program include providing fuel for the university research reactors, conversion of university reactors from highly enriched uranium to low enriched uranium cores, support for a DOE/Utility Matching grants program, and facilitating the use of the reactors as a tool in teaching about nuclear energy. The additional $1.0 million, used for Nuclear Energy's Historically Black College and University program and for Nuclear Engineering and Health Physics Fellowships, is provided from a variety of programs within Nuclear Energy. For FY 1997, our budget request of $6.95 million covers all of these activities as well as upgrades to the university research reactors to improve safety and operability.

UNIVERSITY REACTOR FUEL ASSISTANCE AND SUPPORT

Mr. Myers. What is the long-term strategy for assisting schools that face the high cost of converting from HEU to LEU or assisting those universities that shut down reactors.

Dr. Lash. The Department provides funds for the conversion of reactor cores from HEU to LEU. There are currently nine university research reactors which use HEU cores. Our plans are to convert one of these per year to the use of LEU cores. The conversion process is conducted in two steps with the first of these being a careful analysis of the LEU core configuration that will allow the reactor to maintain its experimental capabilities and meet the Nuclear Regulatory Commission's licensing guidelines. The second step includes the removal of the HEU core and replacement with a fresh LEU fuel. Funds for both of these steps are included in the money Congress has made available for FY 1996 and in our request for FY 1997.

Historically, the universities have borne the costs of decommissioning and decontaminating (D&D) their reactors. Currently, the Department has no plans to provide federal assistance for D&D activities.

TERMINATION COSTS

Mr. Myers. Please provide the status of the following terminations: EBR-II, ANL-W, and the GT-MHR.

Dr. Lash. The highest priority of the termination activities at the ANL-W site is the timely and safe shutdown of EBR-II. The goal is to place EBR-II in an industrially and radiologically safe shutdown condition by the end of FY 1998 for transfer to the Office of Environmental Management for ultimate decommissioning. To date, 311 fuel and blanket subassemblies out of 475 have been removed. Defueling is on schedule to be complete by the end of calendar year 1996. After defueling is completed, the Fuel Manufacturing Facility currently used to fabricate dummy assemblies to replace the removed driver and blanket assemblies in the core will be placed and maintained in an industrial and radiologically safe shutdown condition. Sodium processing activities are on schedule to be completed in August 1998. Currently the sodium processing facility is being modified to add the capability to convert sodium metal to sodium carbonate, a product suitable for disposal as low level waste. The modification is on schedule to be completed in September 1996.

The EBR-II shutdown plan also includes treatment of its discharged fuel to place the fuel constituents in a form suitable for long-term storage. The treatment is proposed to be demonstrated on-site in the Fuel Conditioning Facility. Currently, an Environmental Assessment is being prepared to assess the impacts of demonstrating the treatment technology. If the demonstration is successfully accomplished, the Department will obtain the information needed to determine whether the Fuel Conditioning Facility can be used to treat EBR-II and other stored fuel for ultimate storage. The proposed treatment process will require the use of other ANL-support facilities such as the Analytical Laboratory and the Hot Fuel Examination Facility. These support facilities and the Fuel Conditioning Facility are being maintained in an operational state. Other facilities, including the Zero Power Physics Reactor, Transient Test Reactor Facility, and Argonne Fast Source Reactor, have been shut down and are being maintained in a safe shutdown condition.

A closeout plan for the Gas Turbine-Modular Helium Reactor (GT-MHR) program has been developed and is being implemented. GT-MHR contractor and laboratory expenditures in FY 1996 have been confined to closeout activities. The GT-MHR Plant Design Control Office was closed on September 29, 1995, and its staff reassigned or terminated by their sponsoring organizations. The DOE GT-MHR contract, with ABB Combustion Engineering, Bechtel National and Stone and Webster Engineering Corporation were closed out on December 31, 1995, and personnel were reassigned or terminated by their respective organizations. At General Atomics, 34 personnel were terminated September 29, 1995, and 10 were terminated on December 29, 1995. We have notified the Nuclear Regulatory Commission of the closeout of the GT-MHR program, and suggested that their pre-application design review of this reactor concept be discontinued. The remaining closeout activities at General Atomics and the Oak Ridge National Laboratory include the collection, packaging, off-site shipment, and disposition of DOE supplied equipment, and radioactive materials which were utilized in the GT-MHR program. Further personnel reductions will occur consistent with the requirements of these

TERMINATION COSTS

Mr. Myers. Are these efforts on schedule?

Dr. Lash. Shutdown of the EBR-II and the other unneeded facilities at ANL-W is proceeding consistent with the schedule established in 1995. A proposed demonstration of spent fuel treatment using the Fuel Conditioning Facility is on hold pending completion of NEPA analysis.

The GT-MHR closeout is on schedule, consistent with the DOE closeout plan.

TERMINATION COSTS

Mr. Myers. Are costs in line with estimates?

Dr. Lash. Costs for shutdown of the EBR-II and other unneeded ANL-W facilities are in line with the estimate established in FY 1995. However, the delay in treating spent fuel in the Fuel Conditioning Facility in order to complete required analyses could result in an increase in our total termination estimate in the outyears.

The GT-MHR program closeout costs are consistent with our estimates, the FY 1996 DOE Appropriations, and our FY 1997 budget request for this activity.

TERMINATION COSTS

Mr. Myers. For the EBR-II, what effort is being made to ensure that the reactor could be used again?

Dr. Lash. EBR-II shutdown activities are considered to be reversible until the primary system sodium is drained. The deactivation program will reach this point during the last quarter of FY 1997.

ISOTOPE SUPPORT

Mr. Myers. In Fiscal Year 1995, the budget included $11.9 million for the molybdenum-99 processing and development initiative. Last year, another $12 million was provided, fully funding the Administration's request. Last year's budget justification stated that Mo-99 production should start in the spring of 1996. This year, no funds were included in the request. What is the status of this program?

Dr. Lash. The fiscal year 1995 budget for the molybdenum-99 (Mo-99) processing and development initiative consisted of $7.6 million of appropriated funds and $1.0 million from the revolving fund for a total of $8.6 million. Production of Mo-99 has been delayed because the Department decided to prepare an environmental impact statement (EIS) for the initiative (earlier in the process, an environmental assessment was assumed to be sufficient). The EIS will be issued soon and, if the Department proceeds with its preferred alternative, the production of Mo-99 will begin in the fall of 1996. In addition to preparation of the EIS, technical progress has been made by DOE laboratories for the fabrication of uranium-coated Mo-99 production targets and the chemical extraction and purification of Mo-99. Some equipment required for target fabrication and chemical processing has also been purchased.

Following completion of the EIS, DOE will issue a record of decision on the proposed action. If the decision is to proceed with the production of Mo-99 and related isotopes, project funds for fiscal year 1997 will be identified from within DOE's overall budget.

ISOTOPE SUPPORT

Mr. Myers. What will the source of funds be to continue this program in fiscal year 1997?

Dr. Lash. Following a record of decision to proceed with this project, DOE will identify project funds in fiscal year 1997 from within DOE's overall budget.

ISOTOPE SUPPORT

Mr. Myers. When will the Record of Decision be completed?

Dr. Lash. The record of decision for the proposed production of molybdenum-99 and related isotopes is expected to be issued in May 1996.

ISOTOPE SUPPORT

Mr. Myers. Is this on schedule? If not, why not?

Dr. Lash. The record of decision for the molybdenum-99 project will be issued in May 1996, one month later than DOE's goal. The EIS examined four alternative production sites in detail and DOE received a significant number of comments from the public. The amount of work involved in performing the analyses and responding to the comments to complete the EIS required an additional month of effort . Although issuance of the final EIS is one month behind the original goal, achieving a record of decision just eleven months after publication of the notice of intent to prepare an EIS is a notable achievement.

ISOTOPE SUPPORT

Mr. Myers. Please provide a list of isotopes that are being produced, the purpose, the cost and the lab(s) involved.

Dr. Lash. I would be pleased to provide the information in a table that I would like to insert in the record. The list contains the isotope, laboratory where the isotope is available, costs, and the application. The costs represent the projected manufacturing cost for fiscal year 1996 to produce the isotopes: direct labor, direct material and manufacturing overheads. Manufacturing overheads include common facility support cost, heat, power, waste disposal, ES&H charges, and general supplies. The manufacturing costs for the isotopes do not include such costs as storage and distribution, excess hot cell capacity, customer service, billing and collections, process development, and other general and administrative costs such as financial audits. These nonmanufacturing costs are allocated among the products sold on a percentage basis.

ISOTOPE PRODUCTION AND DISTRIBUTION PROGRAM

PROMINENTLY SOLD ISOTOPES AND THEIR USES
FISCAL YEAR 1996

ELEMENT/ISOTOPES	WHERE AVAILABLE	PRODUCTION COSTS ($000)	IMPORTANT USES
Aluminum/Al-26	Los Alamos (LANSCE)	70	Research related to Alzheimer's Disease and acid rain
Americium/Am-241	Los Alamos (Inventory)	Sales from inventory	Neutron Source for oil well logging; smoke detectors
Calcium/Ca-42, -43, -44, -46, -48*	Oak Ridge (Inventory)	Sales from inventory	Research in nutrition, bone growth, nucleosynthesis, and nuclear physics
Californium/Cf-252	Oak Ridge (HFIR)	500	Cancer therapy (esp. ovarian/cervical cancer); portable neutron sources; reactor monitoring and control
Cadmium/Cd-109	Los Alamos (LANSCE)	87	X-ray fluorescence instrument calibration; silver (Ag-109m) generation (for short-time medical imaging purposes)
Cadmium/Cd-112*	Oak Ridge (Calutrons)	Sales from inventory	Accelerator targets for medical radioisotope production (such as indium-111, used for physiological studies of soft tumors)
Cobalt/Co-60	Idaho (ATR)	266	Radiation sources and cancer teletherapy
Copper/Cu-67	Los Alamos (LANSCE Brookhaven (BLIP)	190	Antibody Labeling for cancer therapy & imaging
Dysprosium/Dy-163*	Oak Ridge (Calutrons)	Sales from inventory	Accelerator research target-neutrino generation

* *Separated Stable Isotopes; all others are radionuclides*

ELEMENT/ISOTOPES	WHERE AVAILABLE	PRODUCTION COSTS ($000)	IMPORTANT USES
Gadolinium-153**	Idaho (ATR)	100	Calibration source for Single Photon Emission Computer Tomography (SPECT) imaging systems and osteoporosis detection
Gallium/Ga-69*	Oak Ridge (Calutrons)	Sales from inventory	Needed in focused ion beam devices for research
Germanium/Ge-68	Los Alamos - LANSCE Brookhaven - BLIP	435 66	Calibration sources for PET equipment; antibody labeling
Helium/He-3*	Mound (Inventory)	Sales from inventory	Lasers; Neutron Detectors; Cryogenics
Iridium/Ir-192	Idaho (ATR) Oak Ridge (HFIR)	316 1410	Industrial Radiography Sources
Iron/Fe-54*	Oak Ridge (Calutrons)	Sales from inventory	Target for Fe-55 (medical isotope); metallurgy/solid state physics
Iron/Fe-57*	Oak Ridge (Calutrons)	Sales from inventory	Agricultural biology
Iron/Fe-58*	Oak Ridge (Calutrons)	Sales from inventory	Solid state physics
Krypton/Kr-78*	Mound	Sales from inventory	Optics (standard light sources); reactor fuel tagging
Krypton/Kr -86	Mound	Sales from inventory	Diagnosis of pulmonary disease

* *Separated Stable Isotopes; all others are radionuclides.*
** *First samples planned in 1996*

ELEMENT/ISOTOPES	WHERE AVAILABLE	PRODUCTION COSTS ($000)	IMPORTANT USES
Lead/Pb-204*	Oak Ridge (Calutrons)	Sales from inventory	Chemical analyses target for Pb-205 (used in geology research)
Lithium/Li-6*	Oak Ridge (Inventory)	Sales from inventory	Physics and chemistry research; neutron capture therapy research
Lutetium/Lu-176*	Oak Ridge (Calutrons)	Sales from inventory	Basic physics research
Molybdenum/Mo-98	Oak Ridge (HFIR)	830	Reactor target for production of Mo-99
Neon/Ne-22	Mound (Inventory)	47	Reactor gas tags to pinpoint fuel leaks
Nickel/N-61, -62*	Oak Ridge (Inventory)	Sales from inventory	Reactor targets for radioisotope formation
Nickel/Ni-63	Idaho (ATR) Oak Ridge (HFIR)	50 100	Gas sensing devices and metabolic radiotracer
Palladium/Pd-103	Oak Ridge	Sales from inventory	Prostate cancer implant therapy
Rhenium/Re-185*	Oak Ridge (Inventory)	Sales from inventory	Reactor target for production of Re-186 (used for treatment of cancer tumors)
Rhenium-186	Oak Ridge (HFIR)	30	Treatment of cancer tumors
Rubidium/Rb-87*	Oak Ridge (Inventory)	Sales from inventory	Geology; chemical analyses; beta source
Samarium/Sm-152*	Oak Ridge (Calutrons)	Sales from inventory	Target for Sm-153 Production (used in medical research including bone cancer/ arthritis)
Scandium/Sc-47	Brookhaven (BLIP)	6	Therapeutic antibody label

* *Separated Stable Isotopes; all others are radionuclides*

ELEMENT/ISOTOPES	WHERE AVAILABLE	PRODUCTION COSTS ($000)	IMPORTANT USES
Silcon/Si-29*	Oak Ridge (Calutrons)	Sales from inventory	Geology; molecular studies
Sodium/Na-22	Los Alamos (LANSCE)	213	Neurological research
Sulfur/S-34	Mound (Inventory)	80	Studies related to human genome research, molecular science, nucleotide sequencing, geology, agriculture, and other environmental applications
Strontium/Sr-82	Los Alamos (LANSCE) Brookhaven (BLIP)	413 290	Cardiac imaging/diagnosis of bone lesions
Strontium/Sr-84*	Oak Ridge (Calutrons)	Sales from inventory	Geology; reactor targets for production of Sr-85
Strontium/Sr-88*	Oak Ridge (Inventory)	Sales from inventory	Reactor targets for production of Sr-89
Strontium/Sr-89	DOE Reactor Site (Planned) Oak Ridge (HFIR)	217 100	Bone cancer pain relief and labeling of monoclonal antibodies
Tellurium/Te-122*	Oak Ridge (Inventory)	Sales from inventory	Reactor target for production of Te-123m, which is being developed as a line calibration source for nuclear medical image scanning devices
Thallium/Tl-203*	Oak Ridge (Calutrons)	4970	Targets for accelerator production of Tl-201 (used in cardiac imaging)
Tin/Sn-117*	Oak Ridge (Inventory)	Sales from inventory	Reactor target for production of Sn-117m, used to treat bone cancer pain
Tin/Sn-117m	Oak Ridge (HFIR)	38	
Tungsten/W-186*	Oak Ridge (Inventory)	Sales from inventory	Reactor target for production of W-188 (used to generate Re-188 for treatment of cancer tumors)

* *Separated Stable Isotopes; all others are radionuclides*

ELEMENT/ISOTOPES	WHERE AVAILABLE	PRODUCTION COSTS ($000)	IMPORTANT USES
Tungsten/W-188**	Oak Ridge (HFIR)	65	Generator (by decay) of Re-188, a beta-emitting radioisotope used to image cancerous tumors and for radioimmunotherapy
Uranium/U-234	Oak Ridge (Inventory)	Sales from inventory	Neutron sensing; control instrumentation
Xenon/Xe-124, -126*	Mound	Sales from inventory	Reactor fuel tagging; targets for reactor production of radioiodine
Yttrium/Y-90	Westinghouse Hanford/Pacific Northwest National Laboratory	480	Cancer therapy
Zinc/Zn-66*	Oak Ridge (Calutrons)	Sales from inventory	Reactor activation reduction
Zinc/Zn-68, -70	Oak Ridge (Inventory)	Sales from inventory	Targets for radionuclide production (e.g., gallium-67, used for soft tumor scanning and diagnosis of Hodgkin's disease)
Zirconium/Zr-90, -92, -94, -96*	Oak Ridge (Calutrons)	Sales from inventory	Irradiation targets for research
OTHERS	All laboratories	800	Production or further processing of other isotopes or byproducts that are usually requested in small quantities

* *Separated Stable Isotopes; all others are radionuclides.*
** *First samples planned in 1996.*

PROGRAM DIRECTION

Mr. Myers. The DOE-HQ average cost per FTE for FY 1997 exceeds $103,000 per FTE. Please provide job descriptions and other sufficient component/element information to document these benefits.

Dr. Lash. The $103,000 per FTE for the Office of Nuclear Energy, Science and Technology is calculated using an end of year staffing level of 99. However, the projected FTE usage during FY 1997 is 107. Using the 107 average results in the $96,000 cost per FTE as shown in our budget request.

NE is a small, highly technical organization. Approximately 2/3 of the staff perform engineering and scientific work. The average grade is that of a mid-level GS-14 employee. This salary level plus related employee benefit costs, such as, Federal Employee Retirement System expenses, health benefits, and life insurance expenses is comparable to the $96,000 average cost per FTE in our FY 1997 request.

PROGRAM DIRECTION

Mr. Myers. The DOE-Headquarters average travel cost per FTE for FY 1997 is $4,788. Please provide information detailing anticipated DOE travel expenses for FY 1997.

Dr. Lash. We are reducing FY 1996 Headquarters travel expenses by 20 percent from the FY 1995 budget. Our FY 1997 plans are to hold the travel budget constant and absorb inflation, except for an increase in travel expenses in the Uranium Program due to a full year of Transparency Measures monitoring activities in Russia.

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PROGRAM DIRECTION

Mr. Myers. The "support services" for the headquarters organization shows a $972,000 increase from FY 1996. Provide a detailed justification for this increase. If this represents support service contract needs, provide the information by contract with a description of the work to be done.

Dr. Lash. The Office of Nuclear Energy, Science and Technology (NE) has aggressively reduced reliance on Support Services contractors. In FY 1995, NE provided a total of $10.1 million for support services. NE's Strategic Alignment Initiative goal for FY 1996 is $8.6 million. However, in recognition of Congressional direction, NE has reviewed the use of support contractors to ensure that they are not used to augment the Federal workforce or to perform inherently Governmental functions. As a result, approved FY 1996 funding to date for Support Services has been reduced to $5.8 million, a reduction of over 40 percent from the FY 1995 level.

The $972,000 shown in the program direction account will be used for general Support Services that benefit all NE programs. These include items such as automated data processing/systems development (software/hardware); mailroom/correspondence/graphics; and implementation of Quality Management principles. The FY 1997 request is the same as approved in FY 1996 and funded from other program budgets.

PROGRAM DIRECTION

Mr. Myers. Provide a detailed justification of the $3,000,000 (Headquarters) for Other Related Expenses. To the extent some portion of the amount is for the WCF, simply show that part without further explanation.

Dr. Lash. The $3,408,000 request consists of $2,407,000 for the Working Capital Fund; $651,000 for one time lump-sum leave payments and associated buyout costs for 12 employees; and $350,000 for other miscellaneous administrative expenses, such as, training, ADP software/hardware purchases, etc.

CIVILIAN WASTE RESEARCH AND DEVELOPMENT

Mr. Myers. The committee provided $703,000 for this account in FY 1995. Last year, neither the House nor Senate provided funding, citing severe budget constraints. In this year's budget justification, DOE revealed that, despite being zeroed out by Congress, the program was funded at 44% of its FY 1995 level. What was the source of these funds?

Dr. Dreyfus. The Fiscal Year 1996 Energy Supply, Research, and Development Appropriation provided no funding for this Civilian Waste Research and Development Program. All funding being utilized for this program this fiscal year is from existing prior years unobligated balances. The Office of Civilian Radioactive Waste Management is using these funds to terminate research projects in an orderly manner and to transfer custody of spent nuclear fuel, currently being stored in casks at the Idaho National Engineering Laboratory, to other programs within the Department of Energy.

Mr. Myers. What funding is anticipated in FY 1997?

Dr. Dreyfus The Office of Civilian Radioactive Waste Management is not requesting funding to support this program in Fiscal Year 1997 This program is being terminated in Fiscal Year 1996 and responsibility for management of spent fuel in casks at Idaho is being transferred to other programs within the Department of Energy.

Mr. Myers. What will be the source of this funding (if any)?

Dr. Dreyfus The Office of Civilian Radioactive Waste Management is not requesting funding to support this program in Fiscal Year 1997. This program is being terminated in Fiscal Year 1996 and responsibility for management of spent fuel in casks at Idaho is being transferred to other programs within the Department of Energy.

CHERNOBYL HEALTH EFFECTS

Mr. Myers. Last year officials from the Ukrainian government asserted there were no lasting health effects from the explosion and fire at Chernobyl. Do you agree with this?

Dr. O'Toole. No, we do not agree with this assessment. The first international conference of the European Commission, Belarus, Russian Federation and Ukraine on the Radiological Consequences of the Chernobyl Accident, held on March 18-22, 1996, (approximately 10 years after the accident) has reported major health effects attributable to the Chernobyl accident.

The major health effect on the exposed population observed during the last 10 years directly attributable to the radiological consequences of the accident and subsequent fallout, is a rise in incidence of thyroid cancer in children who were less than 15 years old at the time of the accident. Over 1,000 cases of thyroid cancer in these children have been reported and there is reason to believe that this increase will continue in the exposed population. As an example in Belarus alone during the previous 9 year period, prior to the accident, only 7 cases of childhood thyroid cancer were reported. Due to aggressive treatment, the number of deaths due to cancer have been very low so far. The inhalation and ingestion of radioiodine from the fallout, which has an affinity for the thyroid gland in children, has been linked to the etiology of thyroid cancer. This clearly indicates a need for supporting long-term epidemiologic studies of thyroid cancer in the exposed population and related dose reconstruction work.

Approximately 200 emergency workers involved in the initial containment and cleanup after the accident received high enough doses to develop acute radiation sickness. They also had complications such as extensive steam and radiation skin burns. About 30 of them died within 2 to 3 months, and of the survivors, 14 more have died over the last 10 years. Only two of these deaths, however, could be attributed to radiogenic causes.

It is reported that there were up to 600,000 other workers involved in cleanup operations in the days and months following the accident at Chernobyl. It is estimated about 12,000 of these received significant doses of radiation. Many of these have been entered into the Chernobyl Registry in order to track their health over time. So far, there is no reported increase in radiation-induced cancers in these workers. From previous data from the atomic bomb survivors in Japan, leukemia is the most likely radiogenic cancer to occur in this population. Thus, we are planning a long-term epidemiologic study on the incidence of leukemia, in order to obtain estimates of risk of developing leukemia in the Chernobyl exposed cleanup workers and the general adult population.

Although there have been no reports of other major health effects directly attributable to the accident's radiological consequences, there have been other major health effects directly related to the accident. For example, in the fallout areas of Ukraine, Belarus and Russia, entire communities have been displaced, the land is ecologically poisoned, and the people are emotionally scarred and afraid of the consequences of radiation.

CHERNOBYL HEALTH CONSEQUENCES

Mr. Myers. What types of health consequences are being recorded?

Dr. O'Toole. I discussed the types of health consequences currently being recorded in

my previous answer. The DOE Chernobyl studies will help establish relationships between radiogenic exposures and their health consequences. As such, they will focus on the epidemiological evaluation of childhood thyroid disease and cancer, blood disorders, such as leukemia and eye tissues (cataracts). These studies include incidence and prevalence of cancers in the clean-up workers, and cytogenetic and immunological monitoring of clean-up workers. Cancer registries also are being established. These efforts will help document and record the long-term health outcomes associated with the accident.

The availability of the genetic and molecular biology techniques permits conduct of studies relating the genetic and molecular changes to carcinogenesis and other diseases, and thus greatly increasing the scientific knowledge on the radiogenic health effects. The latter studies are being supported primarily by the Sosekawa Foundation and European Communities.

EPIDEMIOLOGICAL STUDIES

Mr. Myers. How are the health effects being studied?

Dr. O'Toole. The clinical protocols outlining the epidemiological studies (as discussed above) involve the annual follow up examinations of the populations being studied. This surveillance will be conducted in local dispensaries by local physicians. The American investigators in the studies will review and analyze the results jointly with the local scientists. The study will be periodically subjected to a review by a group of independent experts.

COMPARISON OF CHERNOBYL STUDIES WITH RERF

Mr. Myers. How does the value of the information from Chernobyl health studies compare to the value of information from Radiation Effects Research Foundation (RERF)?

Dr. O'Toole. Both studies provide important scientific information. The difference in the dose rate and the quality of radiation in the two situations can be expected to result in different health effects. Whereas the Hiroshima/Nagasaki A-bomb explosion survivors were exposed to an instantaneously delivered dose at an extremely high dose rate, the Chernobyl accident resulted in the release of low linear energy transfer radionuclides, such as iodine, strontium and cesium. In contrast to the A-bomb explosions, the Chernobyl accident resulted in lower delivered doses but over a longer period of time. The data obtained at RERF have been used for radiation risk assessment and radiation protection standards by various agencies including the National Council on Radiation Protection and Measurements, The International Commission on Radiological Protection, the United Nations Scientific Committee on the Effects of Atomic Radiation, the various Biological Effects of Ionizing Radiation Committees, and Committees of the National Academy of Sciences.

The data from the Chernobyl accident are establishing, for the first time, that childhood thyroid cancer is directly related to the dose received by the exposed population and develops rapidly, with a latent period of about 3 to 5 years. In addition, the genetic differences in the exposed populations of both the former Soviet Union and Japan should provide new information concerning the genetic background predisposition to radiation carcinogenesis.

RERF STUDIES

Mr. Myers. What types of information are being gleaned from each of the studies?

Dr. O'Toole. The RERF studies were the first to provide clear evidence that radiation effects are dose-dependent. Risks related to radiation exposure were clearly defined for the development of various malignant tumors, leukemia, cataracts, delays in growth and development, and other disorders. No correlation has been found between detectable genetic abnormalities and A-bomb exposure. Data from the RERF will be valuable for years to come. The majority of A-bomb survivors are still alive, and further data will provide reliable estimates of lifetime risk for cancer incidence, cancer mortality, and other diseases. For example, recent studies on breast cancer risk estimates, indicating a low risk in postmenopausal women, provide information relevant to concerns about mammography. Survivors irradiated as children or in utero are now entering the years of maximum cancer risk. The RERF data also provides a basis for the development of studies on other populations, such as those in the former Soviet Union, exposed to long-term chronic, versus acute, radiation. The collection and storage of blood and tissue samples from the atomic bomb survivors provides research material that can be used by succeeding generations as new techniques are developed for the assessment of radiation damage.

Concerning Chernobyl, the incidence of childhood thyroid cancer increases over one hundredfold in the exposed population. With regard to other types of cancer, there is no evidence so far for their increase. However, this will need to be tested by reliable epidemiological studies.

RERF BLUE RIBBON PANEL

Mr. Myers. What is the status of the RERF "Blue Ribbon" panel which is studying the current work and future role of the joint foundation? When will the final report be available?

Dr. O'Toole. The panel, which is chaired by Professor Roger Clarke, Chairman of the International Commission on Radiological Protection and Director of the United Kingdom National Radiological Protection Board, met in February 1996 and plans one more meeting in May. The final report is expected this summer.

PANEL RECOMMENDATIONS

Mr. Myers. Do you expect the panel to recommend changes in ongoing programs and a plan for ultimate conclusion of this program?

Dr. O'Toole. Yes. The panel has been charged with making recommendations regarding the content and quality of the current research program, research that should be conducted in the future, the importance and merit of research conducted at the foundation, areas of research that could be conducted together with other institutions both in Japan and

worldwide, and the scientific peer review process. It is anticipated that the report will make recommendations both on changes that should be made in ongoing programs and also on the length of time key programs should be continued.

SUPPORT SERVICE CONTRACTORS

Mr. Myers. What percentage of ES&H work is performed by support service contractors?

Dr. O'Toole. We estimate that 30-40 percent of EH activities are contractor supported, including corporate crosscutting functions such as technical assistance, medical services such as Marshall Islands and the beryllium program, and cost-efficient services such as information management and mail room operations.

TYPES OF SUPPORT SERVICE CONTRACTORS

Mr. Myers. What types of work require the use of support service contractors to provide skills not available in the federal work force?

Dr. O'Toole. The need for support contractors is based upon the lack of specific technical expertise in the Federal workforce in such disciplines as criticality; fire protection; material control and accountability; heating, venting and air conditioning; metallurgy; health physics; chemistry; safety analysis; highly enriched uranium process; seismic; computer security; waste management; physical security systems; occupational medicine; biostatistics; and epidemiology, to name a few.

The Office of Environment, Safety and Health uses contractors to provide support in several ways: First, when national-level technical expertise is required to credibly evaluate DOE policies, programs, and facilities. Second, inspections, evaluations, special studies, and certain skills involve the need for a larger number of specialists in certain disciplines for a defined period of time. And third, physicians, nurses, and technical specialists work in the Marshall Islands program to perform medical exams as well as working at various DOE sites for occupational medicine surveillances, program reviews, and incident/accident investigations. Maintenance of full time Federal staff expertise to meet these surge conditions would not be economically sound nor even possible. In addition, the current Federal skill mix is reflective of the DOE mission of 10 years ago not of the challenges and missions facing DOE today. National-level experts tend to be narrowly focused in their technical areas and will not stay in a position where constant professional growth and intellectual stimulation is not maintained at all times. Therefore, contractors are used to provide surge capacity for such activities and it remains the contractor's responsibility to provide opportunities, stimulation and support for these experts when they are not serving Office of Environment, Safety and Health needs. In conclusion, the Office of Environment, Safety and Health maintains a full time Federal staff at the corporate level to provide oversight, technical assistance, policy guidance, and obtains technical skills on an as needed basis through contractual support.

HIGHLY ENRICHED URANIUM VULNERABILITY STUDY

Mr. Myers. What is the schedule for preparation of the highly enriched uranium vulnerability study?

Dr. O'Toole. The highly enriched uranium vulnerability study project was initiated on February 22, 1996, and a final report will be provided to Secretary O'Leary on August 30, 1996.

Mr. Myers. How much will the study cost?

Dr. O'Toole. Total project cost, including funds from EH, line management, and field offices, is currently estimated at $4.5 million.

Mr. Myers. How many Federal employees and how many contractors will be employed to prepare the study?

Dr. O'Toole. 25 Federal employees and 74 management and operating contractor personnel and consultants are working on the project.

FUNDING FOR DOE FIELD LABORATORIES

Mr. Myers. The budget request indicated that of the total (both defense and non-defense) $176.0 million requested, about $61 million will be provided to DOE field laboratories. Provide some narrative explanation/description relative to the nature of the deliverables which DOE expects for the $61 million and specifically how the products support the mission of the ES&H organization.

Dr. O'Toole. The following table, which I would like to insert for the record, provides an overview of the Department of Energy's field laboratories funding and nature of work provided to the Office of Environment, Safety and Health. The utilization of laboratory personnel is primarily for two reasons: first, the laboratories supply national-level technical experts to credibly evaluate Departmental policies, programs and facilities as well as providing technical assistance for Departmental environment, safety and health policies and programs. Such expertise often is not available within the government. The second reason that laboratory personnel are utilized involves the need for specialists in certain disciplines for a defined period. This surge capacity provides individuals to the Office of Environment, Safety and Health with specific expertise for a specific task. The information follows:

LABORATORIES	FY 1997 ($000)	DESCRIPTION OF SUPPORT
Sandia National Laboratories	263	Technical specialists assist the epidemiologic surveillance program by collecting and analyzing data on health events for all contract workers involving work related illnesses, injuries, absences, disabilities, and deaths.
Los Alamos National Laboratory	942	Technical experts participate on environment, safety and health vulnerability special studies such as the highly enriched uranium vulnerability study and the safety of DOE's plutonium materials. Technical and computer specialists develop and maintain nuclear criticality review programs and codes.
Brookhaven National Laboratory	3,378	Technical experts participate on special studies such as highly enriched uranium. Technical specialists participate in safety analysis and risk assessment reviews of nuclear facility authorization basis for design, construction and/or operations, and decontamination and decommissioning activities. Technical experts evaluate and recommends applications of new nuclear materials technology for Departmental evaluations including plutonium packaging, storage, vitrification, tritium handling, and spent nuclear fuel processing, stabilization, and interim storage. Nuclear safety and regulation experts develop implementation guides and technical standards.

LABORATORIES	FY 1997 ($000)	DESCRIPTION OF SUPPORT
Argonne National Laboratory	4,154	Technical specialists conduct Department of Energy certification reviews for packaging and transportation of nuclear materials with detailed regulatory requirements established by the Nuclear Regulatory Commission and the Department of Transportation. Technical expertise assists the Department of Energy dam safety program with specialized expertise in seismic, hydraulic, and hydrological issues. Technical expertise supports the Department in assisting EH in representing DOE on the Interagency Nuclear Safety Review Panel to evaluate those hazards.
Idaho National Engineering Laboratory	5,629	Technical specialists participate in evaluating worker exposure to radiation. Technical expertise provides support to the occurrence reporting and processing system which collects information on events across the complex providing an experience feedback process to improve safety. Technical expertise participates on special studies such as highly enriched uranium. Technical experts in construction safety assist in development of policy and guidance to improve construction safety performance, and cost effectiveness of DOE construction activities. Training experts provide specialized training in nuclear safety areas across the complex.
Oak Ridge Institute for Science & Education	6,461	Technical experts assist EH and the DOE complex in the conduct of radiological control operations. Additionally, technical expertise assists EH in managing grants, fellowships, and training programs at colleges and universities (the majority of these funds are used for tuition, stipends, and grants to the participants and/or universities). Other training efforts specifically support the technical qualification program and the Training Resources and Data Exchange organization.

LABORATORIES	FY 1997 ($000)	DESCRIPTION OF SUPPORT
Oak Ridge National Laboratory	13,966	Technical experts provide support to the performance indicator program to monitor areas requiring attention and improvements and base the indicators on a risk-based approach. Technical experts in Nuclear Regulatory Commission requirements and regulatory processes provides assistance in developing an infrastructure and assuring a seamless transition to external regulation. Technical expertise participates on special studies such as highly enriched uranium as well as the EH Information System for EH Residents reporting. Technical specialists assist in providing Departmental management tools and on-site technical assistance for Environment, Safety and Health planning and budget formulation across the complex and in assuring that new contracts and renegotiated existing contracts implement environment, safety and health portions of the Departmental Contract Reform initiatives (specialists focus on the development of ES&H Management Plans which identify ES&H accountability mechanisms and management systems, specific ES&H activities to be executed on site and performance measurements. Technical experts develop and maintain computer systems to analyze nuclear criticality conditions.

LABORATORIES	FY 1997 ($000)	DESCRIPTION OF SUPPORT
Pacific Northwest National Laboratory	16,593	Technical specialists participate in studies and accident investigations; support oversight, technical assistance, and policy development for the training and certification technical qualification program; analysis, trending and performance measures; information management; advanced health physics research, including worker dosimetry accreditation and radiation protection guidance; and radiological control activities. In the environmental arena technical experts support environmental radiation protection programs; air quality and water resource protection activities; environmental and ecological risk and standards; and environmental management systems activities. Technical specialists participate in NEPA program activities for implementation guidance and documentation review. While in the health studies arena, technical experts participate in the development of a comprehensive data resource on workers to measure the effectiveness of health protection programs. Specialized nuclear safety engineering experts participate on multidisciplinary operations office or program office teams, readiness reviews, or consult with line managers to address safety issues for nuclear facilities. Technical experts participate with EH in identifying necessary and sufficient standards at selected facilities and monitors the results of all necessary and sufficient processes. These experts require specialized technical expertise with field and operating knowledge as well as support for the Departmental Standards Committee.

LABORATORIES	FY 1997 ($000)	DESCRIPTION OF SUPPORT
Lawrence Berkeley Laboratory	1,272	Technical experts maintain and upgrade the Comprehensive Epidemiologic Data Resource as a public-use data base with the goal of broadening independent access to data collected during studies of the health effects of exposure to radiation and other physical agents associated with the production and use of energy.
Lawrence Livermore National Laboratory	7,939	Technical specialists evaluate the exposure radiation programs, support the Departmental Standards Committee and help to develop workable standards identification and implementation processes such as the Necessary and Sufficient Closure Process. Conduct certification reviews for packaging and transportation of nuclear materials. Develop seismic criteria and technical standards to analyze DOE facilities.
Savannah River Technology	161	Technical experts provide assistance in collecting and analyzing data for the chemical safety outreach program and the birth defects surveillance system for communities around the Savannah River Site.
Westinghouse Hanford	135	Technical experts conduct DOE certification reviews for packaging and transportation of nuclear materials including WIPP acceptance criteria and on site-assistance.

TECHNICAL ASSISTANCE PROGRAM

Mr. Myers. The Technical Assistance category indicates a requirement for $29.2 million in FY 1997. Given that this activity is exclusive of the Federal work force salary and fringe benefits, please describe the nature of the requirement with regard to the elements of cost and what they represent.

Dr. O'Toole. Major industrial U.S. corporations, from Dow Chemical to U.S. Steel to Union Carbide, recognize the need for a strong, internal organization focused on providing a safe workplace through the prevention of accidents, illnesses, and environmental damage. These corporations have recognized that effective safety management not only saves lives, but saves money. The industrial complex managed by the Department of Energy -- with hazards far more serious than any U.S. corporation -- deserves no less. In recommending that the Department maintain a focused "corporate" safety function separate from line program management, the Advisory Committee on External Regulation of DOE Nuclear Facility Safety pointed out that "a strong internal DOE safety management system is essential under any regulatory regime and, for that reason, the transition to external regulation must be done carefully so that it does not disrupt efforts already underway to strengthen and streamline that system."

In 1995, the Office of Environment, Safety and Health reengineered itself into an organization focused on the explicit goal of making DOE safer. Strategic planning revealed that the organization had been overly focused on day-to-day oversight of DOE's operating contractors, often with several layers of duplication. Long lists of non-compliances with outdated rules and orders were not producing a safer workplace. What was lacking was a program focused on providing federal managers the tools they need to improve safety, management systems that are especially important when hazards are dynamic, complex and of high consequence. That effort has become the Technical Assistance program.

Specialists in DOE's Technical Assistance program advise and work with the Department's line programs on matters of environment, safety and health. They are trained and skilled at promoting a new paradigm of safety and health that has as its fundamental tenet that the essence of protecting ES&H at DOE sites is effective work planning, hazard analysis and hazard control. In the brief time since its establishment, the EH Technical Assistance program has paid off time and again in terms of enhanced safety, enhanced productivity, and millions of taxpayer dollars saved.

The functions of the Technical Assistance program include EH specialists in areas such as engineering and materials technology; and safety, risk and environmental analysis. These specialists have unique knowledge of DOE facilities and their attendant hazards and are qualified to assess those hazards and accurately evaluate their risks. Our Technical Assistance program has a centrally-located staff that can transfer knowledge and expertise from one ES&H program to another. This also allows them to address complex-wide issues, such as the vulnerability studies, on a strategic level that helps the line programs set priorities and allocate resources. In addition to assistance to line programs, the Technical Assistance staff provides objective advice and recommendations to DOE senior management about the safety

or environmental impacts of major project alternatives such as nuclear weapons stockpile stewardship, transportation, storage and disposal of high-level radioactive waste, and key facility construction and surplus facility decommissioning. This knowledge is also available to the Congress, regulators, and the public.

I would like to submit for the record a listing of innovations in safety and health management resulting from the technical assistance program as well as specific accomplishments. The information follows:

TECHNICAL ASSISTANCE

Our experience strongly suggests that an effective ES&H technical assistance program will ultimately reduce workplace risks, the need for compliance-based regulation, and cost. Innovations in safety and health management that have resulted from the Technical Assistance Program include:

- Development of "Necessary and Sufficient" Standards for ES&H a way to efficiently tailor standards to fit the wide variety of work and related hazards faced by DOE while building management awareness and accountability.

- Enhanced Work Planning use multidisciplinary teams, including workers and safety personnel, to "build in" safety, streamline planning, and see economies in planned work.

- Hazardous Waste Operations and Emergency Response (HAZWOPER) Implementation Guidance has had ten years of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and DOE waste management experience to develop a tailored, practical guide to effective and efficient implementation of, Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) worker protection requirements.

- National Environmental Policy Act (NEPA) Compliance forged a NEPA process that works better, costs less, and is more useful to decisionmakers and the public.

- Site Mentoring partners safety management specialists with line managers to reinforce, over time, new approaches, programs, and performance expectations.

- DOE Voluntary Protection Program is based on the highly successful OSHA program, DOE now has 18 operating contractors actively engaged in achieving safety excellence to achieve STAR recognition.

- ES&H Management Planning is the annual DOE-wide prioritizing of resource allocations based on relative risk-based ranking of ES&H activities and programs.

- Subcontractor Management of Safety and Health is a pilot program to address issues of liability, roles and responsibilities, work planning, performance monitoring, and contracting.

- Vulnerability Assessments are targeted at most significant risks that require a corporate-wide evaluation and response strategy.

SPECIFIC ACCOMPLISHMENTS

Results achieved to date from DOE's technical assistance program:

- An approach has been put in place by which the Department will save an estimated $26 million over five years by streamlining the DOE National Environmental Policy Act (NEPA) process.

- At DOE's Fernald plant, the enhanced work planning approach has saved almost $2 million in unnecessary maintenance activities and has decreased maintenance backlog by a third through improved efficiencies.

- The "training streamlining" initiative has cut in half the need for initial hazardous waste worker training time, with corresponding savings in labor costs (this model is being transferred throughout DOE in 1996).

- An initiative coined "SAFER" (Streamlined Approach for Environmental Restoration) provides a framework for better decision making tha. results in faster, cheaper and fully compliant cleanups; in 1995 SAFER projects have saved about $6 million DOE-wide.

- At DOE's Idaho site, a state-of-the-art, paperless system was developed to improve management's ability to track injury and illness data, thereby improving program cost-efficiency by reducing return to work times decreasing workers compensation costs, and reducing numbers of staff needed to handle medical records.

- In partnership with DOE's Office of Environmental Management, an integrated safety and health management strategy for the Hanford PUREX plant decontamination and decommissioning has yielded no lost workdays due to worker injuries in over a million work hours, with half a million dollars in savings.

- At the Hanford, Washington, high-level hazardous waste tanks, DOE onsite mentoring has contributed to a 40 percent decrease in recordable injuries and illnesses, improved productivity, and cut the maintenance backlog by 50 percent (Hanford-wide, this program has saved an estimated $5 million).

- Departmental ES&H requirements streamlined from 52 to 11 internal orders with a new process coined the "necessary and sufficient" standards identification process being put in place to define a clear, safe and efficient basis for work to be performed at DOE's facilities.

- EH conducted a series of corporate safety studies and vulnerability assessments to support DOE policy and resource decisions: included assessments of DOE's inventory of nuclear spent fuel, plutonium, and hazardous chemicals. The results of these studies have moved the entire Department as a corporation to address actions to mitigate risks in a timely manner, and to effect permanent solutions to what have been longstanding problems.

SUPPORT SERVICE CONTRACTORS

Mr. Myers. If this is support service contracts, we would like to see the information by contract with specific task(s) statements describing the deliverable to the Government and the attendant utility provided.

Dr. O'Toole. I would like to provide the information requested as an insert for the record. The information follows:

Project Description	Benefit	FY 1997 Request
SUPPORT LINE MANAGEMENT:		
DOELAP - The DOELAP (Department of Energy Laboratory Accreditation Program) is mandated by regulation, 10 CFR 835, and is similar to the Nuclear Regulatory Commission (NRC) private sector NAVLAP (National Voluntary Laboratory Accreditation Program) The DOELAP certifies each DOE facilities' ability to accurately determine a worker's exposure to radiation as measured by individual dosimeters (radiation detection badge). DOE sites issue over 1.5 million dosimeters each year to workers and visitors to monitor them for radiation exposure and demonstrate exposures are low and within established legal limits Day-to-day operations of the DOELAP include irradiating dosimeters and mailing them to facilities, calibration phantoms maintenance, artificial urine and fecal sample preparation and mailing, plus all the many support activities such as record maintenance and data collection and comparison	DOELAP accreditation is essential to demonstrate to workers that their radiation exposure is being measured accurately. We believe that it is most cost effective for EH to centrally manage and fund this corporate crosscutting service at INEL/RESL. Fed FTE's: 7 Contractor FTE's. 10	$2,400k
Enhanced Work Planning (EWP) - In early FY 95, EH implemented a management tool for line management This was a model program which integrated worker health and safety programs into the routine conduct of work, using the three EWP principles of 1) integrated programs, 2) use of multidisciplinary teams to plan work, and 3) worker involvement In FY 96 the EWP initiative has spread to seven sites to transfer lessons learned and success stories across sites with contractors picking up much of the cost of the original sites Funding in FY 97 will be used to further expand the use and application of EWP across the DOE to communicate and transfer this important management and planning tool realize even greater savings and worker protection. Professional federal staff is used to develop the program at the demonstration site and facilitate adoption and success. Support services contractors are used to support the federal staff where they have responsibility for multiple demonstration sites. The support services contractors 1) facilitate the setup of EWP team meetings, 2) assist in production of the work plans, 3) join in job site walk downs prior to jobs to identify hazards, 4) design hazard control strategies, and 5) integrate health and safety disciplines to develop a worker protection program that balances all the work site hazards. This level of effort at the demonstration sites is necessary to allow the site to continue operations while EWP is implemented to show the value of EWP and assist the site in adoption of EWP	Demonstration projects have identified the following savings for line management: almost 40% decrease in recordable injuries at Hanford Tank Farms, almost $2 million cost avoidance at Fernald in maintenance; a $500,000 savings at Hanford-PUREX because of streamlining the planning document process, 33% and 50% decrease in maintenance backlog at Fernald and Hanford Tank Farms, respectively; 43.4% reduction in the labor hours required to perform work and reduction in the average time to conduct a repair from 106 to 60 days at Hanford K-Basin, and approximately $2 million of costs avoided at INEL with the adoption of EWP. As a result of our early pilots at Hanford and Fernald, they have implemented an expansion of the program. Hanford has devoted $900K to an expansion of the program to additional site facilities and Fernald has budgeted $350K to expand the original pilot to site-wide application. The use of contractors is necessary due to skill mix issues. Requires contractors who are experienced in exposure surveillance and work practiced operations --an unusual combination--such as the industrial hygiene mentors who have been assisting at the Hanford task farm. FED FTE's 9 Contractor FTE's 8	$1,850k
DOE Voluntary Protection Program (VPP) - The DOE-VPP is a technical assistance function which recognizes safety and health programmatic excellence. In that capacity, the program serves to provide direct support and guidance to interested field elements by making available the necessary tools and training opportunities for DOE contractor sites to prepare for entry into the DOE-VPP. The proposed deliverables from the contractor are as follows: 1) provide on or near-site technical support, as requested, for assisting Headquarters' personnel in administering the program, 2) working under the guidance of Headquarters' personnel, develop and make necessary arrangements for the conduct of DOE-VPP workshops and, 3) provide experienced, competent safety and health personnel for staffing evaluation teams for site visits to DOE-VPP candidate sites, and report preparation at the conclusion of a site visit. Most of the functions regarding the DOE-VPP are performed by federal employees. Typically, for example, some 70-80% of an evaluation team consists of Federal employees.	The program has resulted in leveraged cost savings far beyond this funding request. Similar to the Occupational Safety and Health Administration's experience with its private sector VPP sites, DOE sites in the program have experienced significant cost savings due to reduced injuries (some 60-80%) and an attendant reduction in workers' compensation costs. For example, one DOE site is saving some $240K annually as a result of reduced back injuries due to an innovative corrective solution proposed by affected employees. This savings is for just one department! DOE-VPP sites have also experienced improved management/ employee/labor relations which has bolstered employee morale and productivity Contractor expertise provides a specialized understanding of commercial VPP programs and a broadened base for evaluating DOE programs. DOE does not have this expertise inhouse. FED FTE's. 4 Contractor FTE's. 2	$400k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Necessary and Sufficient Support - The focus of activities in FY 96 and FY 97 will produce an amendment of 10 CFR 835, the Occupational Radiation Protection requirements; a rewrite of the Radiological Control Manual to a technical standard in support of the amended 10 CFR 835; processing of formal requests for interpretations and exemptions of the amended 10 CFR 835; and a rewrite of the twelve Implementation Guides in support of the amended 10 CFR 835; all to support the cost effective, hazard based and appropriate implementation of 10 CFR 835. The Office will also provide support to line management to facilitate appropriate, cost effective implementation of these documents. To achieve DOE's objectives under the "Necessary and Sufficient" Process in the areas of fire arms safety, fire protection and electrical safety, efforts are underway to assess the need for new or revised safety criteria. Our support services contractor provides us with administrative and technical capabilities that currently do not exist within this organization to support safety committee activities and to develop safety-related guidance documents EH provides assistance to the Departmental Standards Committee initiatives and to line management to implement "necessary and sufficient" sets of environment, safety and health standards. EH also develops criteria and guidance for Department standards-related activities. Finally, the INTERPS response line receives, reviews, researches, and responds to questions regarding DOE directives and occupational safety and health (OSH) standards. In FY 96, the line will respond (average turnaround time 3 days) to approximately 1000 calls from DOE line and operating contractor management, technical staff, and workers on a wide variety of problematic safety and health issues. A recent customer survey indicated that the answers received through INTERPS improved worker health and safety in the field and resulted in significant cost savings to their facility. The interpretations that the line provides are not available from any other federal agency. Customers have said that often that their valuable time is saved since they can get quick answers from one source. The Federal workforce does not have an expert that is technically qualified in the universe of directives and standards that can provide these interpretations. All interpretations are reviewed and approved by a Federal employee.	The objective is to establish and implement necessary and sufficient standards. This program is intended to establish and implement "necessary and sufficient" standards, eliminate standards considered unnecessary, burdensome, and costly, and provide technical assistance to line management to determine "necessary and sufficient" sets of standards FED FTE's .8 Contractor FTE's 13	$2,150k
Construction Safety - The construction safety program consists of three primary elements; development of policy and guidance to improve construction safety performance and cost effectiveness of DOE construction activities, technical assistance to DOE headquarters line programs, and field office staffs responsible for construction safety programs, and representing the Department on national consensus bodies and advisory committees responsible for the development of standards, best management practices, or federal regulatory policy in the area of construction safety In addition, recent analyses of data on accidents and injuries across the DOE complex indicates an increase in construction-type occurrences. Because the types of work are shifting from routine operations to construction-related remediation and D&D-types of activities, workers are required to do their work differently. Guidelines for the prevention of acute musculoskeletal injuries are needed to keep the rate of increase under control. These guidelines will focus on materials handling activities and innovative methods for measuring safety performance and prevention will be developed for better construction contractors and subcontractors	These activities require two federal and three contractor FTE's to accomplish. Of the three contractor FTE's, two (working for LITCO at INEL) are responsible for publication and distribution of the DOE Construction Safety and Hoisting and Rigging Handbooks as well as maintaining these documents on the Internet. These documents are kept up to date with changes in applicable source documents (i.e., applicable OSHA and ANSI standards) and proposed changes are peer reviewed by the DOE Construction Safety and Hoisting and Rigging Committees. The meetings and initiatives undertaken by these two committees also derive administrative and technical support from the LITCO staff assigned to this task. The remaining contractor FTE (at PNL) provides technical support in the development of course curricula, workshops, and other technical assistance efforts aimed at improving the skills of DOE line management responsible for overseeing construction safety performance. In addition to updating and maintaining documentation and presentation materials for previously developed 8-hour workshops on topics such as fall protection, electrical safety, and trenching and excavation, new workshops are to be prepared in the areas of demolition safety and construction safety management. Contractor services are needed for the above activities to supplement the two federal FTE's with the administrative and technical support requisite to the successful accomplishment of these tasks. FED FTE's. 2 Contractor FTE's 3 (LITCO, PNL)	$700k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
HAZWOPER Program - This joint EH/EM program addresses the multiplicity of hazardous waste activities within the DOE's $6 billion environmental management program. Its goal is to help DOE line management improve safety for clean-up workers and emergency responders at hazardous waste sites, develop cost-effective solutions to health and safety issues, and conform to regulatory requirements. The effort began in FY 95 with benchmarking and demonstration projects that imported industry's best management practices which were communicated to the complex via a "HAZWOPER Handbook" and management and worker protection guidebooks released in FY 96. Funding in FY 97 will be used to assist with the implementation of the guidance contained in the Handbook and to develop and enhance HAZWOPER programs at 4 field sites. Finally, guidelines and protocols for the use of engineering controls and other personnel protective equipment in remediation and hazardous/radioactive materials handling will be developed using a risk-management based approach.	The Handbook has had an impact: for example, guidance contained in the Handbook helped Bechtel Hanford save an estimated $3.2 million in training costs and reduce the number of training hours per employee by 50% with a 33% reduction in training courses delivered. This program will be completed in FY 1997. FED FTE's: 4 Contractor FTE's: 8	$1,400k
Workers' Compensation - The joint EH-HR workers' compensation project: (1) collects and analyzes Department-wide workers' compensation program management and cost data for DOE's operating contractors, (2) benchmarks industry's best management practices, and (3) develops contract language to provide incentives for line management to manage workers' compensation and improve health and safety performance. FY 97 efforts will analyze two sites in detail, and identify improvements based on industry's best practices to lower cost. Specialized contractor expertise is necessary to augment EH staff in the area of a working knowledge of private sector workers' compensation management programs.	Private industry proactively manages workers' compensation with dramatic results; for example, OSHKOSH B'GOSH, a clothing manufacturer, realized a 33% drop in workers' compensation costs. A comprehensive study was completed in FY 96 that analyzed DOE's operating contractor workers' compensation costs and identified sites with workers' compensation costs that are higher than industry averages. FED FTE's: 0.5 Contractor FTE's: 0.25	$50k
Federal Employee Occupational Safety and Health (FEOSH) Program. EH established a DOE-wide FEOSH program that meets DOE's requirements under 29CFR1960. EH provides assistance and oversight to the line programs to protect the safety and health of its Federal workforce. The assistance is geared to leverage line management resources by providing hazard intervention strategies that target particularly problematic safety and health issues. The FEOSH program also supports many requests from Operations Office Managers and other field elements to provide specialized technical expertise not available locally. FEOSH also provides model programs needed by several sites where the cost to develop the service/product can be borne once, rather than duplicating the cost at each site. Contractor support is used when FEOSH needs specialized technical expertise (such as for ergonomics), on a short term basis that is not available within DOE or when it is not cost-effective to train a federal employee.	FEOSH technical assistance has had a measurable impact. For example, direct technical assistance to line management eliminated 700 serious hazards at 14 facilities in the last two years by applying cost-effective remedies. FEOSH efforts such as these have lowered the federal employee injury and illness rate by 8.5% in 1995 as compared to the previous 4 years, and the lost work time rate by 6%. In FY 97, FEOSH will analyze federal employee workers' compensation costs to target intervention strategies, and will focus on back injuries, one of the leading causes of federal employee injuries and illnesses.	$200k
Chemical Safety – A chemical safety vulnerability study completed in early FY 95 indicated a strong need for improvements in chemical safety within the Department. A ten step management response plan was developed by Line Management and is in the process of being implemented by 26 sites having significant chemical holdings. The EH Chemical Safety Program supports these site efforts by publishing guidance; identifying the most successful site practices and encouraging their use complex-wide; and providing assistance in achieving compliance with the OSHA Process Safety Management Rule. While FY 96 has focused on strengthening chemical life-cycle management across the complex, resulting in large reductions of excess chemical holdings, FY 97 will concentrate on streamlining chemical hazard identification and control through mentoring with leading chemical companies and adapting, where effective, industry practices. Contractor technical expertise is necessary to supplement the very limited chemical safety expertise available within DOE.	The program serves as a catalyst for enhancing the exchange of safety technology and management experience with private industry resulting in across-complex improvements adopted and sustained by the DOE sites. FED FTE's: 5 Contractor FTE's: 8	$1,450k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Aviation Safety - The Department manages an Aviation Program with activity which equates to that of a large regional airline. We operate more than 20,000 flights per year, carry more than 60,000 passengers and more than 6,000,000 million pounds of cargo using 33 fleet aircraft and supplemented by charter and contract operations. According to the Bureau of Labor Statistics, aviation is the third most hazardous occupational group in the United States after logging and commercial fishing. DOE's recent aviation accident experience confirms the risks in 1990-1992 we had 12 aircraft accidents resulting in 17 fatalities. Aviation safety and aircraft accident prevention necessarily became priority issues. After attempts for many years to manage separate programs throughout the DOE complex, the field offices and program offices requested EH to assume responsibility for policy, direction and assistance with aviation safety and management. Support service contractors provide project-oriented assistance to the core staff of Federal employees. Contractors provide specific, on a short-term, as-needed basis skills not found within the Federal staff. Contractors are currently developing and refining software for support of the Aviation Incident Reporting Program, a backbone of the accident prevention effort. Contractors are developing an Aviation Information System which uses state-of-the-art communications protocols on the Internet for wide area information exchange, cost accounting, aircraft inventory and configuration management, and the development of management decision tool modules which will afford field managers with cost/benefit analyses for buy/sell/lease decisions. The architectures for these systems were developed by the Federal staff and programming and implementation are being performed by the contractors. Another contractor is developing flight dispatch software which will significantly reduce dispatch workload in the field, perform flight-by-flight cost comparisons, maintain legally required records, and automatically produce, format, and transmit to Headquarters, the data which constitutes the basis of our reports to OMB, GSA and Congress. Collectively, these initiatives will reduce field workload by thousands of hours per year, provide on-demand access to the information and significantly improve the accuracy and timeliness of our reports. Contractor support is also used as FAA certified Designated Engineering Representatives and Designated Airworthiness Representatives for aircraft modification and design in support of atmospheric radiation testing. Federal employees provide all programmatic skills and field support which constitutes 60% of the work effort and contractors provide special skill project support which constitutes 40% of the work effort.	The small core aviation staff at Headquarters now supports all field sites with an accident prevention program and its attendant communications infrastructure, operations policy, guidance and interpretation, hands-on vendor inspections, mentoring of field aviation staff members, and operational reporting requirements. Since this staff was fully constituted, we have had no accidents. FED FTE's 6 Contractor FTE's 4	$350k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Decommissioning and Deactivation (D&D) - A critical result of the Department of Energy's (DOE) shift away from nuclear weapons production has been a rapid increase in the number of its surplus facilities. Many of these facilities are decades old and have not only physically degraded, but also remain contaminated with radioactivity, acids and other highly toxic materials and chemicals. Because these conditions alone or combined have created significant safety and health risks to workers, the public and the environment, a large portion of the overall DOE mission has been dedicated to the disposition ing of these aged facilities through various cleanup, environmental restoration and deactivation and decommissioning, or "D&D," projects and activities. In addition to a vast and varied inventory of existing hazardous sources, D&D activities in and of themselves also pose significant health and safety risks to the public, the environment and, in particular, to workers who perform D&D-related tasks and activities. And because the character and nature of hazards and work activities have changed so dramatically, normal, pre-existing, operational requirements and practices are no longer adequate. Consequently, the Department is faced with time and resource-consuming hazards analyses to determine risk and cleanup levels, the development of special procedures and safety and health programs, requirements and guidance that fully address potential exposure to hazardous inventories such as high-level wastes, mixed wastes and nuclear fission products in test and surplused production reactors, and training federal and contractor staff to accomplish the myriad facets associated with such work. Therefore, these long-standing D&D activities will rely heavily on new safety and health programs and requirements, which are currently not well-established, to simplify and streamline safety and hazard analysis as well as D&D work activities expediently and efficiently.	The EH D&D Technical Assistance Project is one among the new crop of responsive and necessary corporate, crosscutting programs. It is staffed and led by a team of DOE federal employees, with initial support from contractor D&D specialists. Because D&D is a new element of the DOE mission, requiring a significant and specific skills base, contractor assistance is needed until EH staff completes the full development of its in-house D&D technical and analytical expertise through on-the-job and formal training. As the Federal skills and experience base strengthens relative to D&D, dependence on contractor support will diminish commensurately. Through the execution of several project activities, EH will ultimately provide line managers with an integrated safety and health management system in addition to high-utility tools for conducting D&D safely and cost-effectively across the DOE complex by: • helping D&D line managers to develop site or facility-specific integrated safety and health strategies at the Hanford, Mound and Savannah River sites • helping D&D line managers resolve issues associated with applicable safety and health requirements for D&D. A D&D regulatory basis will be developed to provide requirements clarification and interpretation and related DOE expectations relative to compliance • developing a DOE standard for the implementation of an integrated safety and health strategy for all Departmental D&D work. • helping line managers in developing and implementing a comprehensive hazard analysis process that will effectively identify and use environmental data to evaluate and control worker health and safety risks during D&D. FED FTE's: 7.5 Contractor FTE's: 10.0	$1,900k
Personnel Protective Equipment (PPE) Testing -- Because DOE is self-regulating, equipment to protect worker safety and health must either be approved by a testing organization at our expense or by DOE itself, with standardized processes and procedures. Examples of PPE which DOE must test include the fully-enclosed suits that protect workers from radiation (particularly plutonium or tritium), air supplies for breathing air inside suits, some respirators that do not have NIOSH approval that filter contaminants from breathing air, and suit/air ensembles used for hazardous materials handling and emergency response. All of this material needs to be performance tested in special facilities that exist at only one laboratory in the DOE system. Contractors are required to submit their PPE for periodic testing, if the PPE design is not changed. If new designs are introduced, they are required to be tested prior to use.	We believe it is most cost-effective to manage and fund this corporate crosscutting program centrally at a DOE laboratory (LANL). FED FTE's: 1 Contractor FTE's: 1.75	$150k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
ES & H Performance Indicator Program A critical success factor identified in the DOE Strategic Plan for environment, safety and health is "ensuring the safety and health of workers and the public and the protection and restoration of the environment" The senior leadership of DOE as well as external stakeholders have a continuing need to access information that relates to measurement of this critical success factor. The primary product of this program, the quarterly *DOE Performance Indicators for Environment, Safety & Health*, supports this need to measure these success factors across the DOE Complex. This report was first issued in March 1996. The quarterly report is complimented by an on-line, computer database that allows up to the minute query of DOE's ES&H Performance Indicators via the internet by both DOE and the general public A secondary objective of the Performance Indicator Program is to both influence the use of and monitor the effectiveness of performance measures for ES&H at all levels of the Departments' operations. The above discussed quarterly report serves as a model program for individual sites or organizations to emulate. In addition, attributes of stronger performance measurement programs are highlighted for other sites and organizations to emulate. Assistance is provided to those sites and organizations with weaker programs	This re-engineered program represents the first time the Department has compiled an integrated, DOE-wide set of performance measures for ES&H. The program includes analysis of the cause of trends, allowing senior managers to more efficiently manage ES&H. The program serves as a catalyst for such measures at all levels of the Department's operations. To reduce costs and minimize administrative burden, data for the program are obtained from existing data sources such as the DOE occurrence reporting system, accident/injury reporting system, and environmental reporting systems. Federal employees working this program are matrixed from across EH and are augmented by national laboratory personnel and services principally for data collection, reduction and analysis. Federal FTEs 6 Contractor FTEs 3	$700k
Operating Experience Analysis: Industrial and governmental organizations routinely collect and analyze data from events to determine causes, commonalities, and paths for incident prevention. The lessons-learned process is a cornerstone of continuous improvement and loss prevention, and the Office of Environment, Safety and Health provides this service for the Department. The Office of Environment, Safety and Health produces two documents in the area of lessons learned. The *Operating Experience Weekly Summary*, which provides lessons learned summaries of events and accidents occurring in the complex in the past week, and the *Safety Notices*, that contain more detailed information on more generic or recurring safety problems.	In many customer focus groups and customer surveys, the *Operating Experience Weekly Summary* and *Safety Notices* are recognized as highly regarded elements of Departmental safety improvement efforts. A recent survey indicated that these publications reached over 50,000 readers, ninety-one percent (91%) reported they read every issue and eighty-eight percent (88%) of those surveyed reported that the publications contributed to improved safety at their facilities. Contractor assistance is needed until EH staff completes development of inhouse technical and analytical expertise through on-the-job and formal training. Contractor funding is essential to review the voluminous safety materials, evaluate lessons learned, prepare and print the periodicals within the short time frame required for effective corrective actions. Federal FTE 3 Contractor FTE 7	$1,400k
Radiological Protection Management Evaluations - All nuclear facilities in DOE are required by law (10 CFR 835) to establish a radiological control program for the protection of workers against radiation exposures	EH provides technical expertise to assist the complex in the conduct of radiological control operations. The assistance include implementation of the rule, developing radiological engineering capabilities, training of personnel and integrating radiological control into planning, scheduling and performance of radiological work. Most of DOE's sites with nuclear facilities received some EH assistance in this area which will continue in FY 97. Contractor radiation protection experts are tasked to provide independent assessments, particularly where sites have no access to national and international experts. This assistance has proven to be cost-effective and desired by the sites. FED FTE's: 2 Contractor FTE's: 2.5	$500k
Conduct environment, safety and health vulnerability assessments, assist in management action plan development, monitor implementation of action plans. - During FY 95 and 96, EH coordinated and completed engineering and materials technology work that produced a comprehensive assessment of the safety of DOE's plutonium materials.	This assessment provided an information base for safe interim storage and ultimate disposition of the materials. EH also participated in the formulation of new standards for plutonium storage. An assessment of DOE's highly enriched uranium was begun in FY 96. This effort was led and coordinated by EH and included personnel and funding from major DOE offices The 28 volume plutonium report characterized the risk and provided the roadmap for the line managers in formulating their remediation plans. EH will have a continuing responsibility providing assistance in the implementation of plutonium remediation plans in FY 97 and will continue its management of the HEU study. These vulnerability studies are of short duration and require a large number of contractors with specialized expertise to supplement federal staff FED FTE's: 5 Contractor FTE's: 3	$600k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Participate in safety analysis and risk assessment reviews of nuclear facility authorization basis for design, construction, operation, D&D activities and for Environmental Impact Statements. Safety environmental support is provided to DOE field elements in the analysis of documents for technical adequacy.	These documents support operations at various facilities, including fuel storage and processing facilities, weapons disassembly facilities, gaseous diffusion plants, and decontamination and decommissioning (D&D) activities. EH is working with safety field elements and contractors to develop an activity-based safety basis for D&D work, including construction of new facilities that will be built to support D&D work. EH utilizes staff and technical contractor expertise specialized in D&D areas as well as chemistry, criticality, and facility safety on a limited task basis to develop these bases for review of technical adequacy of these activities. This support will continue in FY 97 for activities such as the Hanford Tank Waste Remediation System, the Hanford Canister Storage building, high efficiency and particulate filter (HEPA) safety, plutonium ventilation systems, and the gaseous diffusion plants. Contractor support to augment federal staff is essential because of the specialized expertise required (e.g., chemical processing, metallurgy, criticality) and the limited duration of the projects. These experts are familiar with current technology, analytical methods, and operations status of facilities. Additionally, they share their knowledge through training sessions with contractors and DOE. FED FTE's: 10 Contractor FTE's: 5	$1,000k
Evaluate and recommend applications of new nuclear materials technology for DOE evaluations including plutonium packaging, storage, vitrification, tritium handling, and spent nuclear fuel processing, stabilization, and interim storage.	Proper nuclear waste storage and disposal requires application of new analytical methods and technologies. EH assistance and technical support is required in highly specialized areas of physics, chemistry and safety management of plutonium, highly enriched uranium and spent nuclear fuel. EH is developing safety criteria for tritium handling, storage, packaging, shipping and disposal. EH support is also required for the technical evaluation of associated documents including the Authorization Basis, Basis for Interim Operations, and Environmental Impact Statements. Contractor support is essential to support the limited scope and duration of the projects as well as to provide some of the specialized skills. FED FTE's: 1 Contractor FTE's: .75	$150k
Provide specialized nuclear safety engineering assistance to participate on multidisciplinary operations office or program office teams, readiness reviews, or consult with line managers to address safety issues for nuclear facilities.	When requested by program or field offices, EH provides specialized nuclear safety engineering and regulatory assistance to support facility operations. Typically, this support is requested for resolution of complex or controversial safety issues raised by the DNFSB, external stakeholders (public or regulators), or by line management. EH also provides specialized technical support for evaluation of new facility designs in areas of nuclear safety. EH prepares technical recommendations and relies on contractors to supply specialized expertise for limited scope and durations of activities. Many of these activities require expedited evaluations to support operational decisions by line managers. FED FTE's: 9 Contractor FTE's: 5	$1,000k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Conduct DOE certification reviews for packaging and transportation of nuclear materials including WIPP acceptance criteria and on-site assistance.	In the civilian industry the design certification and the regulatory approval of nuclear and other hazardous materials packaging and transportation operations are provided by the Nuclear Regulatory Commission (NRC) and the Department of Transportation (DOT) This is a highly specialized technical expertise with detailed regulatory requirements established by NRC and DOT EH provided this function for the Department's packaging and transportation operation of the special nuclear materials. This involves policy guidance, managing design, testing and training activities related to packaging and transportation. This function was recently (2/96) transferred to EM and will no longer be continued in FY 97 by EH FED FTE's 4 Contractor FTE's 20	$4,300k
Manage the DOE dam safety program, the Interagency Nuclear Safety Review Panel (INSRP), and support DoD reactor evaluations.	DOE owns 23 dams and other water retaining structures that require periodic safety inspections. EH performs this regulatory function with specialized expertise in seismic, hydraulic, hydrological issues and dam safety. EH assures that the dams meet Federal Guidelines and it coordinates activities and results with the Federal Energy Regulatory Commission. EH funding is necessary to support FERC, the Interagency Committee on Dam Safety, periodic inspections, and the technical analysis of specific dam safety issues Several of NASA's space missions involve carrying special nuclear materials as power sources for the satellites. These missions present some risk that the materials may accidently return to earth. EH represents DOE on INSRP per agreement with NASA to evaluate those hazards and limited contractor funding is necessary to assess the many technical diverse documents and to support INSRP FED FTE's: 1 Contractor FTE's: 2.2	$500k
Environmental Regulatory Support: Based on EH's environmental regulatory expertise and familiarity with interagency regulatory issues, EH provides leadership and technical support as an expert resource on multiple committees and workgroups. Current activities involve active participation in over 30 internal DOE workgroups such as DOE's Materials in Inventory Initiative, DOE's Pollution Prevention Work Group, DOE's Performance Assessment Task Team, EM's CERCLA/D&D Work Group, DOE's Ecosystem Management Team, DOE's Hazardous Waste Identification Rule Focus Group, and EM's Steering Committee for the Preparation of DOE 5820.2B on Waste Management. In addition, significant time is spent providing line management support as an expert resource at hundreds of meetings initiated by program and field offices. Occasional contractor support is necessary to conduct specific analysis or data collection activities to support these efforts	Environmental regulations are often extremely complex and are changing rapidly. A corporate environmental regulatory expertise is required to keep program and field management abreast of emerging and changing requirements applicable to DOE operations and projects to (1) avert costly environmental compliance problems and (2) protect the public and the environment. FED FTE's: 1.0 Contractor FTE's: 0.5	$50k
Review Environmental Documentation EH reviews environmental documents prepared by line management based on (1) existing requirements to review/consult/concur in DOE requirements and (2) at the request of line management because of the value of EH's environmental regulatory expertise and/or independence from the program or project. Typically over 200 substantive documents are reviewed each year such as exception requests for offsite mixed waste disposal, annual site environmental reports, performance assessments, waste reduction cross-cut plans, lessons-learned guides, portions of NEPA documents in specific regulatory areas, WIPP 40 CFR 191 Compliance Certification, and reports to Congress and other Federal agencies. Contractor support is used to conduct specific technical analyses to supplement EH or field analyses or to verify the adequacy of the subject materials in areas where EH staff does not possess necessary expertise	Better decisions by line managers based on better information in improved documents (more readable, more accurate, more on-target) is the objective of this activity. Improved documents also improve external acceptance of documents and resulting decisions FED FTE's: 2.5 Contractor FTE's: 1.5	$150k

Project Description	Benefit	FY 1997 Request
SUPPORT TO LINE MANAGEMENT (cont.)		
Corporate Environmental Reporting EH provides a corporate environmental reporting service for the Department to (1) meet internal and external reporting requirements and (2) provide line management and upper management with corporate data and feedback on environmental performance across the complex. Examples include maintaining a tracking system with DOE-wide compliance related information on enforceable agreements and enforcement actions, Federal Facilities Agreements Archive, NESHAPs Subpart H Compliance Database, Annual Site Environmental Reports, a data base on radionuclide effluents and emissions, the National Priorities List for DOE, Department-wide Toxic Chemical Release Inventory Report, environmental regulation tracking reports, and several collaborative reporting efforts with other DOE offices. Contractor resources are used to comply data for analysis and in certain instances to support EH staff experts in analyzing and interpreting data.	In addition to meeting corporate reporting requirements specified in internal and external requirements, there is a corporate need for knowing the status of environmental compliance and environmental performance DOE-wide. The collection and analysis of such data is fundamental to a performance based management system. This assists line management in achieving consistent environmental compliance with requirements and policies, where appropriate, provides a input to the performance management system and provides a foundation for upper management to provide leadership and be in a position to respond to outside inquiry or criticism. FED FTE's: 1.9 Contractor FTE's: 1.5	$150k
Non-DOE-wide Environmental Compliance Assistance - Provide leadership and support to DOE program and facilities in negotiating compliance agreements and developing and implementing compliance strategies. This includes providing a site coordinator for environmental issues for each DOE site.	This once was a key activity and support service provided by EH during the early years of transition into environmental restoration and cleanup. However, when EM was established, and as program and field office environmental compliance management capabilities improved, the need for EH in this activity has diminished. EH plans call for the elimination of this function as a major activity. The EH transition will occur during FY 1996 and FY 1997. After 1997 such services will only be provided on the basis of special request. FED FTE's: 5.5 Contractor FTE's: 0.1	$100k
DOE Historic Preservation Officer - The National Historic Preservation Act and E.O. 11953 require each Federal agency to maintain a historic preservation program and have an identified Federal Preservation Officer. This responsibility was assigned to an employee in EH. The Preservation Officer is the focal point for activities under the Act and among other duties, coordinates the nomination of DOE sites, buildings, and objects with DOI to the National Register. The Preservation Officer also coordinates and consolidates an annual report to the DOI on DOE properties and activities. Contractor support is utilized in the collection of data and to supplement EH technical expertise in specialized areas.	This activity helps to ensure timely and quality submissions to DOI consistent with the public law and executive order. It may also help provide performance measures with regard to the Departments cultural resource management. FED FTE's: 0.1 Contractor FTE's: 0.25	$25k
External Regulation Transition -- In 1993, the Secretary announced her intention to seek external regulation of worker health and safety, a proposal supported by subsequent reviewers (Galvin report, Advisory Committee on External Regulation, etc.). Coupled with an overall transition to external regulation are the numerous privitizations and leasing of DOE facilities that entail switching regulatory jurisdiction from DOE to OSHA and authorized states. This ongoing transition, whether for the Department, as a whole, or by individual facilities, requires identification, review and resolution of implementation issues. These issues include resource impacts (to DOE), requirements arising from DOE-specific requirements, jurisdictional issues between external regulators and DOE, the orderly transition to external enforcement, coverage of privatized facilities, DOE's deregulation of its facilities, and major changes to DOE's internal safety management and oversight functions as a means to transition to a "corporate" model as opposed to regulatory model. This evaluation and resulting determinations entail extensive work with federal staff within DOE, OSHA and OMB, and require expert consultation by support personnel familiar with the spectrum of federal, state and local regulatory experience germane to the issues being resolved in DOE's regulatory transition.	FED FTE's: 2.5 Contractor FTE's: 3.5	$970k

Project Description	Benefit	FY 1997 Request
ES&H GUIDANCE		
Guidance Related to Atomic Energy Act - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. In meeting DOE Atomic Energy Act responsibilities to protect the public and the environment from DOE actions involving radioactive materials, guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, technical standards, and handbooks. Workshops sometimes provide an interactive opportunity to learn new requirements. Special guidance and assistance projects include developing tools for compliance such as computer models like CAP88, an air dispersion and dose assessment model, and RESRAD, a computer model for estimating doses from radionuclide exposures. Specific focus areas for FY 1997 include development and issuance of a series of implementation guides, protocols and manuals to accompany the issuance of 10 CFR 834, DOE's radiation protection rule for DOE contractors, and other radiation protection requirements. Contractor support is utilized in the development of supporting tools and technical protocols for measurement, dose/risk assessment and data analysis	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. The products developed under this activity increases cost effectiveness by supporting a graded approach to compliance and implementation that makes the response commensurate with the hazard. FED FTE's: 1.2 Contractor FTE's: 2.75	$275k
Guidance Related to Clean Air Act - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. Clean Air Act (CAA) guidance documents explain and interpret environmental requirements from a DOE corporate perspective and include media such as memoranda and guidelines. Workshops sometimes provide an interactive opportunity to learn new requirements and share lessons learned to improve cost effectiveness. Current activities include developing guidance on the management of its large inventory of ozone-depleting substances as well as keeping DOE abreast of changing CAA requirements. Contractor support is employed to collect data and information from other public and private sector experiences as well as DOE-wide experiences to support EH staff in developing effective corporate guidance.	The objective is to improve DOE's performance related to conformance with the CAA through value added EH guidance and assistance. These activities lead to more timely and cost effective implementation of CAA requirements FED FTE's: 0.8 Contractor FTE's: 1.5	$150k
Guidance Related to Water Acts - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. The two primary Water Acts that impact DOE are the Clean Water Act and the Safe Drinking Water Act. EH guidance documents explain and interpret environmental requirements and include media such as memoranda and guidelines. Workshops sometimes provide an interactive opportunity to learn new requirements and benefit from DOE-wide lessons. EH also develops guidance on internal ground water protection practices. Contractors are used to develop special protocols and collect data relative to public and private sector experience that can help EH technical experts develop cost effective and protective implementation guidance.	The objective is to improve DOE's performance related to conformance with the Water Act requirements through value added EH guidance and assistance. This activity leads to more cost effective implementation of DOE programs that are risk-based FED FTE's: 0.7 Contractor FTE's: 7.5	$75k
Guidance Related to Waste Cleanup Acts - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. Waste Cleanup Acts include the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Superfund Authorization and Reauthorization (SARA), and Emergency Planning and Right to Know (EPCRA). Guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, information briefs, handbooks, and videos. Workshops sometimes provide an interactive opportunity to learn new requirements. Special guidance and assistance projects include developing tools for compliance such as an RQ calculator for determining if a spill exceeds reporting thresholds and EnviroText, an interagency developed database on Internet that contains state and Federal environmental requirements applicable to environmental restoration sites, and protocols to streamline and accelerate environmental restoration activities compliant with environmental requirements. CERCLA and EPCRA continue to be top priority areas for DOE. Contractor support is used in the development of special assistance materials and to collect data to support EH developed guidance	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. The guidance and assistance including protocols help improve DOE-wide performance in a manner that reduces costs. FED FTE's: 4.4 Contractor FTE's: 6.0	$600k

Project Description	Benefit	FY 1997 Request
ES&H GUIDANCE (cont)		
Guidance Related to Radioactive Waste Acts - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. Guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, technical standards, and handbooks. Workshops sometimes provide an interactive opportunity to learn new requirements. Activities in the radioactive waste area to be focused on are DOE's low-level radioactive waste management practices and compliance with 40 CFR 191 requirements for the Waste Isolation Pilot Plant. Contractor support is used to supplement EH technical resources in data collection and review of DOE and other national and international experience related to waste management activities.	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. EH assistance and guidance improves the DOE radioactive waste regulatory process to make it appropriately consistent with related external requirements and streamline development of new waste management systems which in the long term will improve DOE-wide management of its radioactive material. FED FTE's: 0.9 Contractor FTE's: 0.5	$50k
Guidance Related to Hazardous Substance Acts - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. Hazardous Substance Acts include the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA). Guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, information briefs, handbooks, and videos. Workshops sometimes provide an interactive opportunity to learn new requirements. Special assistance projects include developing tools for waste characterization of mixed wastes and permitting of mixed waste TSD facilities. RCRA and TSCA continue to be top priority areas for DOE. Contractor support is used in the collection and analysis of data and in the development of material that incorporate private and other public sector experience and supplements EH staff experience in specialized areas.	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. This guidance and assistance leads to improved and cost effective performance DOE-wide. FED FTE's: 4.4 Contractor FTE's: 6.0	$600k
Guidance Related to Pollution Prevention Act - EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. Guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, information briefs, handbooks, and videos. Workshops sometimes provide an interactive opportunity to learn new requirements. Special assistance projects include developing DOE-specific protocols for compliance with Toxic Chemical Release Inventory (TRI) requirements for Pollution prevention continues to be a top priority area for DOE. Contractor support is used in the collection of data and analyses to support EH development of guidance and supporting tools.	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. FED FTE's: 0.5 Contractor FTE's: 0.5	$50k
Guidance Related to Cultural Resource Management - EH provides assistance to line management in understanding and implementing cultural resource management requirements through the issuance of guidance documents, workshops, and other special activities. Cultural resource management includes responsibilities under requirements stemming from such laws as the National Historic Preservation Act and the American Indian Religious Freedom Act. Guidance documents explain and interpret environmental requirements and include media such as memoranda, guides, information briefs, and manuals. Workshops sometimes provide an interactive opportunity to learn new requirements and to improve implementation of existing requirements. Contractors support EH staff in data collection relative to DOE-wide cultural resources and to gain experience from the public and private sector.	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance that helps develop DOE-wide consistency in reporting and managing resource in accordance with existing laws and regulations. FED FTE's: 0.6 Contractor FTE's: 0.5	$50k
Guidance Related to General Environmental Protection Program EH provides assistance to line management in understanding and implementing environmental requirements through the issuance of guidance documents, workshops, and other special activities. One area requiring EH guidance in FY 1996 and FY 1997 will be the implementation of an environmental management systems approach, the DOE General Environmental Protection Program. Guidance planned includes the issuance of a technical standard for environmental management systems; the development of corporate environmental performance measures and guidance; and guidance on "necessary and sufficient" environmental requirements. Guidance documents and workshops are planned. Contractor support is used to supplement EH staff development of practical tools and training to help implement the environmental management systems approach DOE-wide. In addition, Contractors provide EH private sector experiences that can serve as important lessons learned to improve DOE implementation.	The objective is to improve DOE's ES&H performance through value added EH guidance and assistance. The environmental management systems approach is being implemented by many corporations nationally and internationally and has potential to significantly improve the cost effectiveness of environmental protection. FED FTE's: 0.5 Contractor FTE's: 1.5	$150k

Project Description	Benefit	FY 1997 Request
ES&H GUIDANCE (cont)		
	FED FTE's: 4.5 Contractor FTE's: 4.5	$500k
INTERAGENCY REPRESENTATION		
Emerging Environmental Regulatory Requirements - Atomic Energy Act - EH monitors emerging environmental regulations that may affect DOE operations and projects. When an advance notice of proposed rulemaking or notice of proposed rulemaking is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. NRC and EPA often promulgate rules, guidelines, or technical standards that may affect DOE as precedent setters to DOE Atomic Energy Act responsibilities even though they may not directly be applicable to DOE. Contractor support is used to supplement EH experience in highly specialized analyses and to collect data relative to burdens or impacts of proposed regulations on DOE activities.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings, reduced regulatory burden and avoided non-compliance situations. These activities also provide input to the development of effective DOE implementation guidance and assistance and provide a heads up to DOE field elements relative to up coming requirements. FED FTE's: 1.5 Contractor FTE's: 1.5	$150k
Emerging Environmental Regulatory Requirements - Clean Air Act EH monitors emerging environmental regulations that may affect DOE operations and projects. When an advance notice of proposed rulemaking or notice of proposed rulemaking is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. Clean Air Act Amendments and potential regulatory reform initiatives have made regulations by EPA particularly active. Contractor support is used to supplement EH staff expertise in selected technical areas and to assist in the collection of DOE-wide data to identify burdensome requirements and implementation problems.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings and avoided non-compliance situations. FED FTE's: 0.6 Contractor FTE's: 0.5	$50k
Emerging Environmental Regulatory Requirements - Water Acts EH monitors emerging environmental regulations that may affect DOE operations and projects. When an advance notice of proposed rulemaking or notice of proposed rulemaking is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. The two primary Water Acts that impact DOE are the Clean Water Act and the Safe Drinking Water Act. Contractor support is used to supplement EH staff expertise in selected technical areas and to assist in the collection of DOE-wide data to identify burdensome requirements and implementation problems.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings, reduced burden of regulations and avoided non-compliance situations. These activities also provide input to the development of effective DOE implementation guidance and assistance and provide a heads up to DOE field elements relative to up coming requirements. FED FTE's: 0.5 Contractor FTE's: 0.5	$50k

Project Description	Benefit	FY 1997 Request
INTERAGENCY REPRESENTATION (cont)		
Emerging Environmental Regulatory Requirements - Waste Cleanup Acts - EH monitors emerging environmental regulations that may affect DOE operations and projects. When an advance notice of proposed rulemaking or notice of proposed rulemaking is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. Waste Cleanup Acts include the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Superfund Authorization and Reauthorization (SARA), and Emergency Planning and Right to Know (EPCRA). Potential reauthorizations and regulatory reform initiatives have made regulations by EPA particularly active in this regulatory area. Contractor support is used to supplement EH staff expertise in selected technical areas and to assist in the collection of DOE-wide data to identify burdensome requirements, implementation problems, and other impacts of the proposed regulation on DOE activities.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings and avoided non-compliance situations. These efforts lead to significant cost savings, reduced regulatory burden and avoided non-compliance situations. These activities also provide input to the development of effective DOE implementation guidance and assistance and provide a heads up to DOE field elements relative to up coming requirements. FED FTE's: 4.8 Contractor FTE's: 3.0	$300k
Emerging Environmental Regulatory Requirements - Radioactive Waste Acts - EH monitors emerging environmental regulations that may affect DOE operations and projects. When an advance notice of proposed rulemaking or notice of proposed rulemaking is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. Radioactive Waste Acts include the Low-Level Radioactive Waste Policy Act and the Nuclear Waste Policy Act. This area also includes waste management standards affecting DOE that are promulgated by EPA and NRC. Contractor support is used to supplement EH staff expertise in selected technical areas and to assist in the collection of DOE-wide data to identify burdensome requirements and implementation problems. Contractors also collect data relative to international practices related to such regulations.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings and avoided non-compliance situations. These efforts lead to significant cost savings, reduced regulatory burden and avoided non-compliance situations. These activities also provide input to the development of effective DOE implementation guidance and assistance and provide a heads up to DOE field elements relative to up coming requirements. FED FTE's: 0.4 Contractor FTE's: 0.5	$50k
Emerging Environmental Regulatory Requirements - Hazardous Substance Acts - EH monitors emerging environmental regulations that may affect DOE . When an advance notice of proposed rulemaking or a notice is published, EH solicits comments and/or data from program and field offices, analyses the impacts, and submits a consolidated departmental response to the regulatory agency. EH then acts as the lead advocate for DOE's position in interactions with the regulatory agency to ensure that DOE's concerns are considered. EH also performs scientific and technical reviews of standards under development by other agencies and groups. Hazardous Substance Acts include RCRA & TSCA. Potential reauthorizations and regulatory reform initiatives have made regulations by EPA particularly active in this regulatory area. Contractor supplement EH staff in selected technical areas and to assist in the collection of DOE-wide data to identify burdensome requirements and implementation problems.	The objective of this activity is to head off oncoming regulatory inefficiencies by making the regulator aware of the unique problems faced by the Department in implementing proposed regulations, guidelines, or standards. These efforts lead to significant cost savings and avoided non-compliance situations. These efforts lead to significant cost savings, reduced regulatory burden and avoided non-compliance situations. These activities also provide input to the development of effective DOE implementation guidance and assistance and provide a heads up to DOE field elements relative to up coming requirements. FED FTE's: 5.0 Contractor FTE's: 3.0	$300k
OSHA MOU - Funding for this project is used for an interagency agreement pursuant to a 1995 Memorandum of Understanding between the Department of Energy and the Department of Labor, Occupational Safety and Health Administration (OSHA). Federal personnel from OSHA are providing technical assistance in the development of a systematic approach to the orderly transition from internal DOE oversight of worker health and safety to external enforcement by OSHA. The project entails pilot studies at DOE facilities. The studies will produce an estimate of the resource impacts that such a transition will have on OSHA and DOE, identify specialized training that OSHA personnel will require to oversee unique DOE hazards, identify rulemaking required by OSHA, and identify jurisdictional interface issues. Some of the funding will be used for an independent examination of the issues, by an organization such as the National Academy of Public Administration.	FED FTE's: 2	$500k

Project Description	Benefit	FY 1997 Request
INTERAGENCY REPRESENTATION (cont)		
Regulatory Transition/Liaison - Develop and implement a corporate infrastructure to support the radiological protection aspects of the movement to external nuclear regulation. Transition all Department of Energy sites to external regulation by the Occupational Safety and Health Administration. Independent study to identify and resolve cross-cutting transition issues, such as jurisdictional and resource issues. Provides cost-effective, consistent approach to external regulation that can be leveraged across the DOE complex. Provide the corporate resource to "shadow" the regulator to be the Departmental liaison. In this capacity the office would know of pending regulatory activity to coordinate Departmental comments, translate Regulations to internal, Line Program managers to facilitate implementation and provide the direct interface on issues and interpretations.	Establish the radiological protection portion of the formal MOU for the interface with identified external regulator. Develop appropriate sets of implementation documents for regulations adopted by external regulator. Participate on transition group formed to guide the conversion to external regulation and to resolve associated issues. Adapt existing radiological regulations, standards and training for new set of radiological protection regulations and guidance. Maintain current list of government-owned contractor-operated sites that are under DOE jurisdiction until DOE transition to external regulation is complete. To have a seamless transition to external OSHA regulation at all DOE sites, by working directly with OSHA to identify and resolve jurisdictional and other issues prior to the transition. FED FTE's: 4.0 Contractor FTE's: 4.0	$500k
External Nuclear Regulation - This project ensures that the existing infrastructure for nuclear regulatory activities under the Price Anderson Amendments Act is reflected in existing regulatory processes to facilitate transition. It also provides assistance, as requested, to the Advisory Committee on External Regulation.	Implement the Department's current statutory nuclear regulatory programs. Provide an orderly transition to external regulation. Assures personnel have complete knowledge of the transition issues. Provide training and assistance to avoid regulatory sanctions. Establish DOE positions on nuclear regulatory issues and pending legislative matters. Interface with appropriate regulatory and Congressional entities. FED FTE's: 3 Contractor FTE's: 3	$325k
DNFSB Technical Support - Coordinate and prepare responses to the DNFSB, guidance, and reports, including 91-6, 93-3. Continue to respond to numerous DNFSB requests for Radiation Protection data due to their heightened and historical interest in radiation protection as a measure of DOE Management commitment.	To coordinate the fulfillment of commitments made by the Secretary in the Implementation Plan to the DNFSB Recommendation 91-6. To act as the management sponsor and point of contact for the "Radiation Protection Qualification Criteria" as related to the Departmental Response to Recommendation 93-3. To coordinate other DNFSB related activities such as responding to information requests, reviewing Departmental correspondence related to DNFSB activities and preparing responses to DNFSB correspondence. FED FTE's: 1.0 Contractor FTE's: 1.0	$400k

TECHNICAL ASSISTANCE PROGRAM

Mr. Myers. If, these requested resources are for contractors, provide the rationale relative to why this work is not/can not be accomplished within the federal work force. We would also like to understand with some specifics the utility/benefits that this effort provides to the field element line manager who have the ES&H responsibilities. Please focus your response to the three categories described in the budget--that being (1) line management support, (2) environment, safety and health guidance and (3) interagency representation, making sure that each response is specifically for that subcategory within "Technical Assistance".

Dr. O'Toole. The Office of Environment, Safety and Health has several technical assistance functions for which it utilizes contractor technical support. In general, it is more cost effective and beneficial to utilize contractors in these areas than to increase the base Federal work force. This contractor technical support is necessary because: First, the diversity of expertise and the depth of expertise necessary to fully satisfy the breadth of the mission and responsibilities of the office cannot be satisfied with the limited size of the office's full-time FTE base. Second, the overall work load fluctuates throughout the year and is largely externally driven. It is more cost effective to maintain a core group of environmental experts to deal with a the normal workload and utilize contractor support for specialized analyses and episodic overflows. The use of DOE national laboratories and other selected contractors allows the office to access a broader pool of highly specialized technical expertise on an as needed basis for short term projects. This expertise complements EH staff expertise such that EH staff benefit from the hands-on and specialized expertise of contractor technical staff and can apply this knowledge to its broad corporate ES&H responsibilities.

Third, many situations exist for which occasional but specialized expertise is needed by several DOE offices. It would be duplicative for these DOE offices to develop similar expertise. It is more cost effective to utilize contractor support for these activities. This approach also allows the office to obtain varied perspectives on a given issue and to keep abreast of developing technology. Fourth, due to the complexity of the policy and technical issues addressed by the office, EH requires senior level technical staff. Some of the activities within the office require time-consuming and labor intensive data collection and analysis which is more effectively accomplish by less senior analysts. Contractor support in these areas provides the limited resources of the Federal expert to be more productively employed. Fifth, use of the contractor pool also provides the office with access to a broad perspective (industry and other Federal agencies) by providing experience and lessons learned gleaned from other public and private sector clients. Last, use of contractor resources also minimizes the need for DOE capital purchases for specific computer technology, analytical equipment and so forth which are already available at contractor facilities.

POLICY PROGRAM

Mr. Myers. The Policy category shows essentially level activity (only slight decrease proposed in FY 1997) over FYs 1995-1997. Insofar as this is non-federal personnel activity in the sense that no federal salaries/fringe benefits are included, please describe the exact

nature of the activity or activities, whether this is support or technical contract work, and, if so, why the program is not being done with the Federal workforce in this organization, which is considered substantial.

Dr. O'Toole. The Department is "self-regulating" in the areas of occupational, safety and health; radiation protection; and nuclear safety. EH is responsible for developing ES&H requirements in these areas. The EPA or the states regulate DOE activities in the area of non-radiological environmental protection. In a limited number of areas (e.g., radionuclide air emission and uranium mill tailings cleanups), EPA or NRC directly regulate radiological protection activities for DOE operations. Where EPA, NRC, or the states have jurisdiction, EH has the corporate ES&H responsibility to develop DOE-wide ES&H policy to implement these external requirements.

The Department must develop and maintain safety and health requirements and standards to protect workers, the public, and the environment including our natural and cultural resources. Additionally, the Department policies and standards must ensure compliance with environmental laws and regulations. The development of policy, requirements and standards in environmental, safety and health areas is a "policy" activity of the Office of Environment, Safety and Health.

The Department imposes safety and health requirements by means of contract terms and conditions (i.e., DOE Orders) and regulation (i.e., DOE rules). Additionally, in response to the National Performance Review recommendations to lessen the burden on regulated entities, the Department revised its Orders to remove unnecessary, prescriptive and conflicting requirements. The goals are to improve and streamline DOE ES&H directives and to establish Department-wide policies that are consistent with regulatory reform and are flexible performance-based approaches to environmental, public and worker protection. This includes the replacement of existing command and control approaches with flexible more cost-effective environmental and safety management systems that integrate DOE work activities with ES&H functions. There are a number of statutory, legal and management reasons why the Department is changing the way it "self-regulates" and implements external health and safety requirements, but fundamentally it is to enhance safety and improve performance of its contractors.

The policy activity of promulgating DOE rules and revision of DOE Orders required the republication of major nuclear safety rules and the revision of ES&H DOE Orders in FY95, and responding to comments and resolving rule and Order issues in FY96. Most DOE-EH Orders and nuclear safety rules will be published in FY96, but several rules or portions of the rules are scheduled for FY 1997. Additionally, the Department anticipates further work in policy development to improve performance-based and management system approaches to ES&H. Therefore, policy activity continues in FY97, albeit at a reduced level.

The policy activity in nuclear safety also includes the management of the DOE program that develops and utilizes non-government standards to the fullest extent practical as required by the National Technology Transfer and Advancement Act of 1995 (P.L. 104-113). This will encourage DOE and its contractors to use technical standards adopted by voluntary consensus

standards bodies to reduce burdens and to enhance global competitiveness for products developed by DOE National Laboratories.

Contractors are tasked to provide supplemental expertise in technical areas such as radiological protection, criticality, seismic, nuclear facility design -- or in regulatory areas to evaluate commercial and private sector regulations and performance-based approaches to regulation. This contractor support is crucial at this time as the Department is transitioning from contractual to regulatory management of contractors when more flexible implementation processes require better Departmental policy, guidance and standards. Additionally, other Department initiatives such as contract reform, integrated standards-based safety management, and transition to external regulation require intense policy interactions to ensure DOE ES&H requirements and perspectives are properly integrated.

POLICY "VALUE ADDED"

Mr. Myers. Also, what "value added" can be attributed and how does it serve/help the field element managers.

Dr. O'Toole. The Department's ES&H performance is enhanced by a common body of policy, requirements and standards that are imposed generically across the complex. This ensures that DOE activities are in full compliance with all applicable laws and regulations and that all DOE contractors, many of whom are at different sites, work from a stable and predictable platform of requirements. Additionally, a corporate ES&H policy function allows the Department to interact with other federal agencies that promulgate ES&H requirements to ensure the technical and procedural quality of those requirements that will be imposed on DOE activities. These interactions are a major "value-added" for DOE, its contractors, and the other Federal agencies.

These policy initiatives will help make ES&H activities more cost effective and implementable. By applying graded and performance-base approaches using DOE-wide performance measures and allowing for the establishment of program-or site-specific performance measures, DOE will achieve its ES&H goals in a manner that provides field managers with the flexibility to adapt appropriate requirements (including those based on non-government standards) to their respective operations. Therefore, these policy initiatives have significant potential to benefit both DOE field elements and the Department corporately.

NATIONAL ENVIRONMENTAL POLICY ACT PROGRAM

Mr. Myers. The NEPA category, as with Policy, shows a level profile over the past several years. Please prepare a response similar to the response for the question above, which describes the nature of the activities, why they are not being done with the federal work force, and what is the attendant value added to the field elements.

Dr. O'Toole. The National Environmental Policy Act (NEPA) requires all federal agencies to conduct a process that ensures that agencies and the public are informed of the potential environmental consequences of major federal actions before decisions to implement

proposed actions are made. Because compliance with NEPA is a prerequisite to implementation of nearly all of the Department's new programs and projects, timely and adequate NEPA documents are critical to the Department's mission. NEPA reviews build public trust and provide a framework for addressing policy and technical concerns, potential siting difficulties, issues of concern to State authorities and local citizens, and permitting issues. NEPA requires that agencies consider alternatives to proposed actions, sometimes resulting in the selection of better or cheaper ways to meet mission needs. Failure to comply with NEPA requirements results in significant costs due to litigation and project delays.

The Office of Environment, Safety and Health NEPA program (NEPA program) serves as a corporate resource that supports the timely completion of the NEPA process and implementation of the Department's proposed activities by providing technical assistance to line management (program) and field elements, including assistance in preparing NEPA documents and independent review and approval of documents. The NEPA program supports the full range of Department program activities, including energy, waste management and weapons complex technologies and facilities.

The NEPA program adds value for program and field element managers by ensuring consistency and quality of their NEPA documents, including the technical content and treatment of Department-wide crosscutting issues. The NEPA program further serves program and field element managers by providing guidance and training to increase the efficiency of field NEPA personnel, and by serving as a liaison to the Council on Environmental Quality, the Environmental Protection Agency and other federal agencies. In addition, the NEPA program takes steps to streamline the Department's NEPA process by revising regulations and DOE Orders to reduce NEPA costs and regulatory burdens while maintaining quality. The NEPA program has developed and is implementing a plan that will reduce the Department's NEPA compliance costs by more than $26 million over 5 years, in accordance with the Department's Strategic Alignment Implementation Plan.

These corporate functions are provided best and least expensively at the headquarters level. Attempting to duplicate these essential functions at the field level would be inefficient and ineffective.

The NEPA program needs contractor resources to carry out these functions for the following reasons: NEPA regulations require that agencies prepare NEPA documents using an inter-disciplinary approach, and integrate the NEPA process to the fullest extent possible with other environmental review laws and requirements. Preparing and reviewing Department of Energy NEPA documents requires expertise in a wide range of technical disciplines such as, impact analysis methodologies for water resources, air resources, endangered species, floodplain and wetlands, radiation health effects, chemical health effects, accidents, socioeconomic concerns, and fate and transport modelling, to name just a few, and knowledge of the full range of environmental laws and requirements like the Clean Air Act, Endangered Species Act, National Historic Preservation Act, and many others. It is not possible to cost-effectively maintain the required breadth and depth of technical expertise using only federal staff. The NEPA program, therefore, relies on contractor resources to ensure access as needed to specialists with expertise in the appropriate disciplines.

NEPA regulations provide that contractors that prepare NEPA documents must not have financial or other interests in the outcome of the project. To ensure access to appropriate technical specialists, and to avoid conflicts of interest that a contractor may have regarding NEPA reviews for proposed actions at some facilities, the NEPA program manages several NEPA program support contracts.

Deliverables to the Government include review comments and suggestions to ensure the technical adequacy of environmental impact statements and other environmental documentation; technical guidance on environmental impact assessment methodologies to help program and field personnel prepare NEPA documents; technical and logistics support for other guidance development and workshops that increase the efficiency of program and field NEPA document preparers; and technical support for regulatory development and other efforts to streamline the Department's NEPA process.

Planned FY 1997 Cost Elements include technical and logistics support for: implementing NEPA contract reforms and other NEPA process improvements that will reduce NEPA compliance costs in accordance with the Strategic Alignment Initiative for $250,000. Conducting workshops and issuing guidance to increase the Department's efficiency in preparing NEPA documents for $800,000. Continuing to enhance public participation opportunities for $100,000. Continuing to provide technical assistance to ensure completion of major programmatic environmental impact statements and assisting in the preparation of site-wide and other environmental impact statements and related documents for $2.35 million.

Primary task assignments for FY 1996 are as follows: first, Analytical Services, Inc. provides support in reviewing NEPA documents for technical sufficiency and support in preparing technical guidance ($1.525 million). Second, Energetics, Inc. provides support in reviewing NEPA documents for technical sufficiency and support in preparing technical guidance ($800,000). Third, Oak Ridge National Laboratory provides support in reviewing NEPA documents for technical sufficiency and support in preparing technical guidance ($900,000). Lastly, HAZMED, Inc. provides support in preparing technical guidance, primarily preparing guidance regarding incorporation of Environmental Justice considerations in NEPA documents ($100,000).

The NEPA program occasionally may seek special expertise from other national laboratories, such as the Argonne National Laboratory for $25,000 and Pacific Northwest National Laboratories for $150,000.

MANAGEMENT AND ADMINISTRATION

Mr. Myers. This activity is at or near both FY 1995 and FY 1996 levels so far as dollar resources. The justification materials contain insufficient information for this funding request. Please provide narrative that justifies each of the four (4) categories comprising Management and Administration. To the extent a portion of the $23.1 million is for support service contracts, provide the information by contract with descriptions of the deliverable to the Department and associated estimated costs.

Dr. O'Toole. The Management and Administration activities are divided among four programs. The Environment, Safety and Health Management Plan is the process that enables consistent identification of needed Departmental environment, safety, and health activities DOE-wide. The plan also provides for effective budget decision-making of environment, safety and health resources, and improved accountability for environment, safety and health performance. Contract Reform promotes improved performance of operating organizations in managing significant environment, safety, and health risks in a cost-effective manner. The emphasis of contract reform is focused on procurements and contractor selection processes; definition of environment, safety, and health incentives; and development of environment, safety, and health performance measures. The Information Management program identifies and facilitates access to data and information to support the reporting, teaching, trending, analysis, and dissemination of environment, safety, and health information. The Technical Training and Professional Development program assures that the EH staff are properly trained to perform their duties. The environment, safety, and health training infrastructure provides for EH staff development programs in the areas of professional, technical, and information management proficiency as well as fellowships and grants to further industrial hygiene and health physics disciplines and development of safety and health technical qualifications standards for DOE-wide use. I would like to provide additional information requested as an insert for the record. The information follows:

Management and Administration

The Management and Administration program has 4 components: ES&H Management Plan, Contract Reform, Information Management, and Training.

1. ES&H Management Plan

Provides for technical assistance in the development and implementation of ES&H management processes critical to successfully achieving the end objective of "doing more with less." Currently, the DOE spends over $2 Billion on ES&H activities. Better efficiencies must be achieved and accountability mechanisms for contractor performance need to be established. The Secretary's Contract Reform Initiative, which now encompasses the ES&H Management Plan, is a primary vehicle for accomplishing these goals.

The DOE-wide ES&H management process calls for identification of needed site-by-site environment, safety and health activities; risk-based priority setting; and cost-effective allocation of environment, safety and health resources as a part of budget formulation. The process has been expanded to include budget/program execution so that the Department can truly "follow-the-dollars". The extension of the process to fully cover planning, budgeting and execution is new to the DOE and will require technical assistance efforts, at least through FY 1997, equal to those of prior years to assure expeditious and quality implementation.

Once the DOE and its contractors have fully implemented the ES&H management process successfully, this particular technical support function can cease as well as contractor support.

Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$3,000	$3,000	$3,000
Contractor FTE's	16	16	16
Federal FTE's	5	5	5

Current Work Scope:

- Provide Departmental management tools and on-site technical assistance for ES&H Management Planning Process to assure consistent application of ES&H Planning and Budget Formulation across complex.
  Deliverables:
  - ES&H Management Plan Guidance Manual,
  - Beta tested Foxpro run-time executable database software program with Users Manual and expert user advise and troubleshooting,

- Field visits at each major site and operations office to facilitate software training for new users, orient managers with the process, assist development, facilitate scoring) - throughout first half each fiscal year. (On-site Assistance is provided to each of the 8 Operations/ Fields Offices and to 25 Sites - average 660 assistance days annually.

- Provide technical assistance to each cognizant Secretarial Officer to support departmental ES&H budget decision-making.
  Deliverables: Assistance Visits to each Headquarters Program Office and Database training.

- Upon field delivery of ES&H Data, assist EH in analysis of program and field ES&H plans and budgets to assure resource requested are adequate to address departmental expectations, concerns and risks.
  Deliverable: Analysis of ES&H Budgets for Each Site - The Office of Business Performance Systems incorporates this Information into the Office of Environment, Safety and Health Briefing Book for Corporate Budget Review process by July 1 each fiscal year.

- Communicate departmental ES&H programs, issues and resource needs with external stakeholders in support of budget cycle phases (field, internal, OMB, Congress).
  Deliverable: Report of DOE wide and cognizant Secretarial Officer Specific ES&H Issues and budget analysis. Report is used by the office to formulate the annual ES&H Budget Plan (5 year plan).

Benefit:

- ES&H Management Plan assistance is provided as a departmental corporate function for cost efficiency and consistency of application. Cost to the department would be substantially greater if technical assistance was obtained to implement these new processes by each program office. Also, consistency and uniformity, which is a necessary aspect of the process from a Headquarters decision-making standpoint to help eliminate "stove-piping," would be jeopardized.

- Implementation of ES&H Management Planning process support will eventually be passed entirely to line programs and sites. Level of support for FY 1998 will decrease 25% from FY 1997 level with continued decline in the future. Continued Temporary nature of support does not justify hiring of permanent federal staff. However, process implementation has been impacted by new contract reform requirements and downsizing from strategic realignment. As a result, there remains a need for contractor resources until full implementation can be achieved.

- Instability of the DOE-wide workforce as a result of Corporate downsizing of the complex and transition to new Contractor management at numerous sites has resulted in turnover of ES&H staffs assigned to oversee implementation of the process. This

results in continued demand for technical assistance to implement process for planning and formulation. This level of assistance would not be necessary in a more stable employment environment.

2. ES&H Contract Reform

ES&H Contract Reform assures new contracts and renegotiated existing contracts implement environment, safety and health portions of the departmental Contract Reform Initiatives. Major program emphasis for contractor support is focused on working with the Operations Offices/new contractors on the development of ES&H Management Plans which identify ES&H accountability mechanisms and management systems, specific Environment, Safety and Health activities to be executed on site and performance measurement.

Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$2,000	$2,000	$2,000
Contractor FTE's	10	10	10
Federal FTE's	3	3	3

Current Work Scope:

- Assist EH in review and comment on ES&H Management Plans submitted by new Performance Based Contractors for each site. (within one month of receipt).
  Deliverables: In FY 1996 plans for review include Rocky Flats, Oak Ridge, Sandia National Laboratory, Nevada test site. Activity will continue with new contracts being awarded in FY 1997

- Assist each new Performance Based Contractor in implementation of elements of effective ES&H business management as required by ES&H clauses (within first six months of each new contract)
  Deliverables: On-site Assistance is provided to each new Contractor and Operations/Fields Offices as new contracts awarded.

- Establish partnerships with selected sites to integrate ES&H management planning with overall site-wide risk management, planning and budget execution systems.
  Deliverables: Technical Assistance is being provided in FY 96 to pilot ES&H Management Plan (sitewide execution documents) at the Savannah River, Oak Ridge (K-25), and Sandia National Laboratory. Estimate 90 additional assistance days in FY 1996.

Benefit

- Technical Assistance in implementing new ES&H Contract Reform clause requirements is considered a temporary requirement which will require two to three years to fully implement across all Departmental operations. While a major portion of the activities related to contract reform are currently performed by Federal staff, the temporary nature of technical assistance provided by EH does not justify hiring permanent Federal staff.

3. Information Management

The ES&H Information Management program is as follows:

A. Assessment and Service Fees:
Charges levied by the Office of Human Resources and Administration for information resources infrastructure (e.g. leased lines, dial-up services, Internet services, cellular telephones, pagers, etc.) and services (e.g. computer, library, and maintenance service) provided to EH.

Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
Computer Assessment Charges & Fees	$ 1,438	$ 852	$ 900
Communication Services Fees	204	193	200
Total Assessment Fees	$ 1,642	$ 1,045	$ 1,100
Contractor FTE's	0	0	0
Federal FTE's	1	1	1

B. Purchases:
Acquisition of computer hardware/software and licenses, upgrades, supplies and replacements for existing equipment.

Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
Hardware			
Replace/Upgrade	$ 469	$ 567	$ 750
Video Conferencing		200	0
Software			
LAN Licenses, Upgrades and Additions	$ 66	$ 75	$ 100
Total Purchases	$ 535	$ 842	$ 850

	FY 1995	FY 1996	FY 1997
Contractor FTE's	0	0	0
Federal FTE's	1	1	1

C. Cross-cutting systems operation, maintenance and/or development:
Operation, maintenance and/or development of DOE environment, safety and health reporting systems including information systems that support (i.e. crosscut) all DOE programs. These systems include: Comprehensive Epidemiologic Data Resource (CEDR), Performance Indicator Data System (PIDS), Radiation Exposure Monitoring System (REMS), Non-Compliance Tracking System (NTS), Safety Issues Management System (SIMS), ES&H Technical Information Services (TIS), Occurrence Reporting and Processing System (ORPS), Computerized Accident/Incident Reporting System (CAIRS) and the Radioactive Materials Packages (RAMPAC) database for use in tracking construction, use, and maintenance of radioactive packagings in the field.

Contractor Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
Total Cross-cutting systems	$ 5,698	$ 4,626	$ 5,160
Contractor FTE's	34	28	28
Federal FTE's	3	3	3

D. Support Services:
Includes EH's end-user technical support, computer training, information services (Newsletter, Conferences, Information Center) and Internet services (i.e. Environmental Policy and Assistance, National Environmental Policy Act (NEPA), DOE Lessons Learned, DOE Voluntary Protection Program, ES&H Policy/Standards Process Improvement Team, and Operating Experience Analysis and Feedback.) Systems include: Document Imaging System (DIS) for records management Oversight Management Information System (OMIS) for oversight, Facility Profile Information Management System (FPIMS) for retrieval of DOE facility/site data, Executive Correspondence Tracking System for tracking senior management correspondence, e-mail services provide electronic communications, and the EH Information System (EHIS) for Site Representative reporting.

Contractor Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
Total Support Services	$ 7,140	$ 5,587	$ 4,990

	FY 1995	FY 1996	FY 1997
Contractor FTE's	52	39	36
Federal FTE's	4	4	4
Total	**$ 15,015***	**$ 12,100**	**$ 12,100**

* The total of $12,701,000 in the budget does not include funding for information management systems that transferred in the restructuring to information management.

4. Training

EH Staff Training

To develop and improve the skills mix of EH staff in order to support the effective implementation of the EH mission and programs. This program focuses on skills development in the areas of general professional development, technical qualifications, and information management proficiency. All training for EH staff is allocated based on the criteria of (1) mandatory training required by law regulation; (2) training that provides skills and knowledge critical to the performance of the employees current assignment; (3) training required to maintain job-related professional certification; and (4) training that provides skills or knowledge enabling the employee to perform tasks currently being performed by a contractor. These funds are used for the payment of tuition and related costs for EH Federal employees training.

Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$ 200	$ 400	$ 400
Contractor FTE's	0	0	0
Federal FTE's	2	2	2

Fellowships and Grants

Certain technical disciplines that are crucial to carrying out the work of EH are historically short of qualified graduates. To ensure the education and development of the future DOE workforce, and to ensure a continuous base of ES&H knowledge for both DOE and DOE laboratories, EH supports grants, fellowships, and training programs at colleges and universities. The majority of these funds are used for tuition, stipends, and grants to the participants and/or universities.

Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$ 2050	$ 3400	$ 3400
Contractor FTE's	3	3	3
Federal FTE's	less than 1		

Contract Work Scope

Administer the various programs of fellowships, faculty grants, and minority college support for the DOE. Includes advertising for candidates, administering payments (such as tuition, stipends, and grants), and reporting of status.

Benefit

There is no existing DOE organization which could perform the administration of these programs with the same efficiency at as low a cost.

Specialized ES&H Training

EH support to Departmental training efforts, specifically the Technical Qualification Program, and the TRADE organization; and radiation protection and nuclear safety training for use Departmentwide, including annual membership dues paid to the Institute for Nuclear Power Operations (INPO).

Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
TRADE	$ 420	$ 320	$ 100
Technical Qualification Program	400	300	200
Rad. Prot./Nuclear Safety Training	3,550	2,200	1,520
INPO	380	380	380
	$ 4,750	$ 3,200	$ 2,200
Contractor FTE's	25	15	10
Federal FTE's	4	4	4

GRANTS, FELLOWSHIPS PROGRAM

Mr. Myers. Within the "Technical and Professional Development", the Committee notes $3.4 million for grants, etc., to colleges/universities to ensure development of future DOE EH work force. Provide the requirement for expenditures of Government funds for such activities.

Dr. O'Toole. The Office of Environment, Safety and Health supports an Applied Health Physics Fellowship Program, an Industrial Hygiene Fellowship Program, and Health Physics Faculty Award program, a Minority College Program, and a postdoctoral research program in radiation sciences. These programs support over 60 undergraduate, graduate and postdoctoral students, as well as faculty and minority colleges, across the United States in critical job shortage disciplines. Most fellowship graduates are employed in the DOE complex, plus a 3 month practicum at a DOE site as part of the program. Faculty Research grantees are teamed with a DOE site to do direct research in support of the site. The postdoctoral research program in radiation sciences will involve candidates in several of our radiation research efforts including the Radiation Effects Research Foundation and the Russian studies. Additional information on each of these programs is provided as an insert for the record. The information follows:

1. Applied Health Physics Fellowship Program

- 30 Fellow were supported in FY 1995, 30 Fellows are projected to be supported in FY 1996-98
- Fourteen universities maintained participating status during FY 1995, with thirteen hosting Fellows
- Eighteen DOE facilities and four DOE Operations Offices are currently listed as DOE participating practicum centers. In FY 1995, fourteen Fellows served practicums at seven separate practicum centers

Benefits

- Provide graduate school level candidates to fill critical shortage jobs in health physics
- Direct support to sites to address critical issues during student practicums
- Strengthen ties between the academic community and DOE facilities in health physics education, research, and training
- Encourage graduating Fellows to accept employment with DOE or the National Laboratories
- Enhancement of the academic community's commitment to maintain MS degree programs in health physics

Outcomes

- Through FY 1995, 83 Fellows have obtained M.S. degrees in health physics
- 87 practicums completed at DOE facilities (equivalent of 21.7 scientific person years of effort)
- 63% of all graduating Fellows who entered the job market in FY 1994 found employment with DOE or the National Laboratories. Despite downsizing within the DOE complex, 46% of Fellows who graduated in FY 1995 were employed by DOE or one of its contractors. 44 Fellows are currently working for DOE or the National Laboratories.

Funding (dollars in thousands)

FY 1995	FY 1996	FY 1997
$ 820	$ 900	$ 900

2. Industrial Hygiene Fellowship Program

- Program has 15 Fellow enrolled at 11 participating universities; program is expected to enroll 15 Fellows in FY 1997 and FY 1998
- 19 participating universities (this is approximately 30% of the universities that

have graduate programs in IH)
- 34 practicums have been completed at DOE facilities (this is equivalent to 8.5 person years of IH-related effort)
- IHGF has played a major role in having radiation science included in the graduate IH programs of participating universities

Benefits

- Fellows' practicum directly support DOE and contractors' missions
- Graduates are prime candidates to fill DOE's needs for industrial hygiene
- Strengthen ties between DOE and the academic community (21 facilities participate as practicum sites)
- Fellow' practicums contributed to a better understanding of DOE problems:
  - Beryllium sickness at Rocky Flats
  - Radiation exposure at 1.9 GEV synchrotron at LBL
  - Legionella bacteria in cooling towers at ORNL
  - Carbon monoxide from gas forklifts at BNL
  - Use of SN_6 gas at Phillips Linear Accelerator at BNL
  - Employee exposures to electromagnetic radiation at LLNL
  - Compliance status of ventilation systems at LBL
  - Open-path FTIR monitoring of indoor air quality
  - Solvent exposures and chemical documentation at ANL
  - PBPK model for methyl mercury in the pregnant rat
  - Chemical Hygiene Plan at LLNL
  - ES&H survey of an optics fabrication lab at LLNL
  - Noise dosimetry in P-Tunnel at NTS
  - Characterization of respirable silica dust at a radiological site at LLNL

Outcomes

- 22 fellow graduated with master's degrees in Industrial Hygiene
- 34 practicums completed at DOE facilities (equivalent of 8.5 scientific person years effort)

Funding (dollars in thousands)

FY 1995	FY 1996	FY 1997
$ 595	$ 525	$ 525

3. Health Physics Faculty Research Award Program

- 123 applications have been received and 12 awards have been made
- 10 universities have been involved and 7 DOE facilities have established collaborative arrangements
- 8 undergraduate, 25 graduate, and 2 Ph.D. candidates have been partially supported by this program

Benefits

- Enhances the quality and status of graduate programs in health physics
- Strengthen ties between the academic community and DOE
- Direct research support with significant DOE Impact

Outcomes

- Over seventy refereed publications have been produced since the program's inception in 1992
- All eight existing awardees are working in support of DOE facilities
- Assisted in (examples) TLD development, advanced measurements, technology transfer
- Over $125,000 has been raised in cost sharing funds to complement the research activities

Funding (dollars in thousands)

FY 1995	FY 1996	FY 1997
$ 450	$ 595	$ 595

4. Minority College Program

- 5 ORNL staff members have participated in Team teaching the Radiation Science course at Florida A&M University
- Over 20 students have attended various classes
- 2 students in the first-year of the program changed their option and elected the radiation health option

Benefits

- The Program brings in institutions and individuals who have been traditionally underrepresented in Environmental Health Professions

Outcomes

- Through a linkage with the Oak Ridge National Laboratory, Florida A&M University has approved a radiation health option in its graduate Environmental Science program
- The first graduate program in Health Physics at an Historically Black College and University (HBCU) has been established

Funding (dollars in thousands)

FY 1995	FY 1996	FY 1997
$ 80	$ 80	$ 80

5. Postdoctoral Research Program in Radiation Sciences

This Radiation Effects Research Foundation (RERF) grant program will establish a Center of Excellence for radiation research in the United States, to train the next generation of radiation research scientist. The DOE is asking a US-based university or consortia of universities to begin a landmark training program in the field of radiation research. The program will fund a postdoctoral fellowship program and provide postgraduate training in such areas as radioepidemiology, biostatistics, and radiobiology. An important goal is to encourage the creation of a university "center of excellence" dedicated to radiation research. Students in this program will perform work in the RERF program in Japan and the Former Soviet Union health studies. Proposals have been received and are being evaluated. Grant will be made this year.

Funding (dollars in thousands)

FY 1995	FY 1996	FY 1997
$ 0	$ 650	$ 1,000

TRAINING PROGRAMS

Mr. Myers. Also provide the specifics of the remaining training/development dollar request (presumed to be $2.6 million).

Dr. O'Toole. EH is supporting the Departmental training efforts specifically in the Technical Qualification Program and the Training Resources and Data Exchange (TRADE) organization for a total of $200,000 in FY 1997. Funds will be used to complete development of technical qualification standards in the following functional areas: quality assurance, fire protection, radiation protection, occupational safety and industrial hygiene.

EH also develops radiation protection and nuclear safety training for use Departmentwide including annual membership dues paid to the Institute for Nuclear Power Operations. FY97 will see the completion of the requirements for the annual refresher training for hazardous waste workers, and the inclusion of the RCRA/TSD and emergency responder training requirements into the overall training program. An establishment of minimum competencies required by hazardous/radioactive materials handlers will be completed and prevention practices will be incorporated. In area of nuclear safety, training is necessary to ensure comparability of Departmental nuclear safety training policy, standards, guideline and handbooks with commercial nuclear safety training rule 10 CFR 830.330, and DOE 5480.20A; requests for exceptions, or exceptions and interpretation of selected requirements; development of an additional five standards and maintenance of over forty standards, guidelines and handbooks; delivery of training courses on the Systematic Approach to Training; and Basic, Advanced, and on the job Instructor training; and interface with the Nuclear Regulatory Commission, Institute of Nuclear Power Operations, and commercial industry nuclear training groups such as Middle Atlantic Nuclear Training Group (MANTG). These training activities total $2,200,000.

ELEMENTS OF COSTS FOR MANAGEMENT AND ADMINISTRATION

Mr. Myers. Provide information which describes the elements of cost (i.e. contracts, material, etc.) which comprise the total $23.1 million; for support service contracts, provide the detail and amounts by contract with attendant task descriptions of the requirement.

Dr. O'Toole. The information requested is provided as an insert for the record. The information follows:

Management and Administration

The Management and Administration program has 4 components: ES&H Management Plan, Contract Reform, Information Management, and Training.

1. ES&H Management Plan

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Once the DOE and its contractors have fully implemented the ES&H management process successfully, this particular technical support function can cease as well as contractor support.

Contract Funding (dollars in thousands)

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	$3,000	$3,000	$3,000
Contractor FTE's	16	16	16
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Current Work Scope:

- Provide Departmental management tools and on-site technical assistance for ES&H Management Planning Process to assure consistent application of ES&H Planning and Budget Formulation across complex.
  Deliverables:
  - ES&H Management Plan Guidance Manual,
  - Beta tested Foxpro run-time executable database software program with Users Manual and expert user advise and troubleshooting,

- Field visits at each major site and operations office to facilitate software training for new users, orient managers with the process, assist development, facilitate scoring) - throughout first half each fiscal year. (On-site Assistance is provided to each of the 8 Operations/ Fields Offices and to 25 Sites - average 660 assistance days annually.

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Benefit:

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Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$2,000	$2,000	$2,000
Contractor FTE's	10	10	10
Federal FTE's	3	3	3

Current Work Scope:

- Assist EH in review and comment on ES&H Management Plans submitted by new Performance Based Contractors for each site. (within one month of receipt).
  Deliverables: In FY 1996 plans for review include Rocky Flats, Oak Ridge, Sandia National Laboratory, Nevada test site. Activity will continue with new contracts being awarded in FY 1997

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Computer Assessment Charges & Fees	$ 1,438	$ 852	$ 900
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Total Assessment Fees	$ 1,642	$ 1,045	$ 1,100
Contractor FTE's	0	0	0
Federal FTE's	1	1	1

B. Purchases:
Acquisition of computer hardware/software and licenses, upgrades, supplies and replacements for existing equipment.

Funding (dollars in thousands)

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Replace/Upgrade	$ 469	$ 567	$ 750
Video Conferencing		200	0
Software			
LAN Licenses, Upgrades and Additions	$ 66	$ 75	$ 100
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Federal FTE's	1	1	1

C. Cross-cutting systems operation, maintenance and/or development:
Operation, maintenance and/or development of DOE environment, safety and health reporting systems including information systems that support (i.e. crosscut) all DOE programs. These systems include: Comprehensive Epidemiologic Data Resource (CEDR), Performance Indicator Data System (PIDS), Radiation Exposure Monitoring System (REMS), Non-Compliance Tracking System (NTS), Safety Issues Management System (SIMS), ES&H Technical Information Services (TIS), Occurrence Reporting and Processing System (ORPS), Computerized Accident/Incident Reporting System (CAIRS) and the Radioactive Materials Packages (RAMPAC) database for use in tracking construction, use, and maintenance of radioactive packagings in the field.

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Total Cross-cutting systems	$ 5,698	$ 4,626	$ 5,160
Contractor FTE's	34	28	28
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Total	**$ 15,015***	**$ 12,100**	**$ 12,100**

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Contract Funding (dollars in thousands)

	FY 1995	FY 1996	FY 1997
	$ 200	$ 400	$ 400
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Federal FTE's	2	2	2

Fellowships and Grants

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Contract Funding (dollars in thousands)

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INPO	380	380	380
	$ 4,750	$ 3,200	$ 2,200
Contractor FTE's	25	15	10
Federal FTE's	4	4	4

AVERAGE FTE

Mr. Myers. The average FTE salary/fringe benefit costs for FY 1997 exceed $103,000 per FTE; this is considerably higher that the average FTE costs for most other elements in the DOE HQ organizations. Provide sufficient detail to explain and justify this per FTE average.

Dr. O'Toole. Within the EH non-defense activities budget request, the average FTE cost for salary/fringe benefits of $103,000 in FY 1997 is not excessive when compared to Headquarters organization of comparable size. For example, the weapons program with 311 headquarters FTEs has average salary/fringe benefit costs for FY 1997 of $126,900. Similarly, the Energy Research program with 254 FTEs has an average cost of $124,900 in FY 1997 and the Nonproliferation and National Security program is requesting 353 FTEs with average salary/fringe benefit costs of $106,700 in FY 1997. The salary and benefits paid to EH employees in the non-defense activities are necessary to provide a Federal staff with the technical expertise required to perform the essential EH mission. The EH mission requires experts to develop overall environment, safety and health policy guidance for DOE site and facility operations; provide a central and coordinated source of technical expertise and assistance to all field elements not possible within their staffing limitations; provide a central clearing house for information, analysis and feedback regarding new efforts, present activities, and unforeseen occurrences taking place at the multitude of diverse facilities within the DOE complex; and develop, plan and direct the overall environment, safety and health programs throughout the entire DOE complex. Since the major recipients of these efforts are the management and operating contractors as well as National Laboratory personnel, who are considered nationally recognized technical experts, we must staff our organization with equivalently recognized specialists. To obtain and retain Federal personnel of this caliber requires the hiring at higher average wage rates. This explains the relatively high per FTE cost. The justification for this high grade structure lies within the high level of responsibility assigned to the staff. EH personnel are in an advisory or oversight position relative to other Headquarters elements, field elements, and management and operating contractors, including National Laboratories. Technical expertise and wide experience are required in Federal staff to achieve the trust and respect of other Federal and contractor staff who must respond to the advice or oversight provided. Technically credible, and experienced personnel are expensive. The FTE cost of equivalent contractor or laboratory personnel would range from $150,000 to $300,000 per FTE. EH is currently above our FTE ceiling. We have buyouts planned as well as permanent change of station moves to help the skill mix of technical expertise within the EH organization. These costs add to the overall average FTE cost. EH feels that the current grade structure is the minimum possible to perform its mission effectively.

ENVIRONMENT, SAFETY AND HEALTH FTEs

Mr. Myers. Given the fact that virtually every field element (and certainly the operations/field offices) have substantial ES&H organizations/staffing in both the DOE and contractor organizations), explain why there are 316 FTE's at headquarters.

Dr. O'Toole. The 316 FTE's reflected in the ES&H non-defense activities budget request represent those personnel required to provide technical assistance to headquarters line

management and field operations, as well as those required to establish overall environment, safety and health policy throughout the DOE community. More than two thirds of the FTE's are utilized to staff a cadre of technical experts who develop overall environment, safety and health policy guidance for DOE site and facility operations; provide a central and coordinated source of technical expertise and assistance to all field elements not possible within their staffing limitations; provide a central clearing house for information, analysis and feedback regarding new efforts, present activities, and unforeseen occurrences taking place at the multitude of diverse facilities within the DOE complex; and develop, plan and direct the overall environment, safety and health programs throughout the entire DOE complex. EH maintains a full time federal staff at the Headquarters level to provide overview and policy guidance and obtains field skills on an as needed basis through the use of contractor support. There is no sizable EH field FTE structure as in the case of most other DOE organizations. The balance of the headquarters FTE's are utilized to provide administrative and clerical support to this cadre of technical experts.

ENERGY RESEARCH

In testimony submitted last year, Martha Krebs said: "U.S. industry relies heavily on the Department's facilities to conduct experiments that would otherwise be too expensive or even impossible to carry out in the United States. The demand for operating time at our basic research facilities has increased dramatically and in most cases has exceeded availability by a factor of two to three. Funding limitations have restricted operating time at these facilities and have prevented us from meeting the increased demand. As a result, most of the Department's research facilities are currently underutilized."

Mr. Myers. Which U.S. industries rely "heavily" on DOE facilities?

Dr. Krebs. Below is a listing of 15 United States industrial sectors that use Basic Energy Sciences program user facilities.

Industries that Use Basic Energy Sciences Facilities

Industrial Sectors	Companies
Semiconductor	Advanced Micro Devices, TI, Digital, Intel, Motorola
Metals/Materials	Alcan, Reynolds, Alcoa, Conductus, 3M
Biotechnology	Genentech, AMGEN, Cytec, Ciba Vision, Syntex
Chemical	Allied Chemical, BP Chemicals, Dow, E. I. DuPont, Eastman, Monsanto, Raychem, Upjohn, Wacker-Chemitronic
Pharmaceutical	Bristol-Myers Squibb, Aguoron Pharm., DuPont Merck, Hoechst-Celanese, Proctor and Gamble
Communications	Bell Communications, AT&T Bell Laboratories
Aerospace/Aircraft	Boeing, Pratt and Whitney, Rockwell International
Heavy Machinery	Allison Engine, GE, Babcock and Wilcox, Caterpillar, Detroit Diesel, Cummins Engine, Rockwell International, Siemens Industrial Automation
Petroleum	Amoco, Chevron, Exxon, Texaco, Gas Research Institute, Mobil, Phillips, Schlumberger-Doll, Unocal
Automobile	Chrysler, GM, Ford
Computer	IBM, HP, Digital
Image	Polaroid, Eastman Kodak, Xerox
Packaging	Celanese

Instrumentation	Beckman Instruments, Nano Instruments, Industrial Automation, X-ray Instrumentation Associates

Mr. Myers. Which DOE facilities/programs provide resources to the private sector?

Dr. Krebs. Industrial users may participate as general users through acceptance of projects with scientific merit as determined by peer review or, in the case of the synchrotron light sources and neutron sources, as partners in a research team for a specific beamline. Proprietary research is charged on the basis of full-cost recovery. For example, the tandem accelerator at Brookhaven National Laboratory, when not being used as an injector for the Alternating Gradient Synchrotron, is used to study the effects of radiation on integrated circuits and also for the production of "micro-pore" filters. Also at Lawrence Berkeley National Laboratory the 88 inch cyclotron is used to improve the radiation hardness of integrated circuits for space applications. Some limited financial support is available in the case of some facilities for faculty/student research teams from U.S. institutions.

Mr. Myers. What is the breakdown between private, university, and government sponsored scientists for each of these programs?

Dr. Krebs. The breakdown of users is about 13% from industries, 47% from universities, 26% from government laboratories, and 14% from foreign institutions.

Mr. Myers. For each of these categories, what resources are provided to domestic users vs international?

Dr. Krebs. Less than 0.5% of the foreign users are sponsored from the private sector. Of the remainder of the foreign users, about 90% are from universities and about 9% from government laboratories.

Mr. Myers. The Complex Carbohydrates Center has analyzed chemical structures for more than 135 corporations. What is the estimated cost of these analyses?

Dr. Krebs. The Complex Carbohydrate Research Center at the University of Georgia in Athens, Georgia, receives full cost reimbursement from its corporate users by assessing a fee of $500 per analysis performed. The Complex Carbohydrate Research Center provides a number of services to the scientific community aside from performing analyses. These other services activities include providing training courses using specific analytical tools, the development of new technologies and strategies for carbohydrate analysis, and serving of a resource center of scientific expertise. The Complex Carbohydrate Research Center receives approximately $1.58 million per annum from the Department of Energy to support the various services listed above as well as operating an extensive research program. The Center also supports Carbbank, an international, electronic-reference resource for the structural characterization of carbohydrates.

MULTIPROGRAM ENERGY LABS - FACILITY SUPPORT

Mr Myers. Line item construction project MEL-001: In several instances the funding profiles do not seem to represent the total estimated costs for the subproject. Our review assumes the sum of prior year, FYs 95-97, and future years should equal the total estimated cost. That is not the case in some of the profiles. Please review the profiles for each subproject and provide updated funding profiles by fiscal year.

Dr. Krebs. In the construction project MEL-001 data sheet, the sum of prior years, FYs 95-97, and future years should equal the current total estimated cost under the column heading, "TEC." In the case of one subproject titled Electrical Safety Rehab at PNNL on page 355, there is an error in the future years amount shown in the data sheet. All amounts are correct except the future years amount which should be $1,500 thousand instead of zero. The future years total in item 7 of the data sheet on page 353 and the unappropriated balance on the Construction Project Summary on page 351 should be $22,079 thousand instead of $20,579 thousand. Corrected budget pages are attached.

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
(Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support

1. Title and Location of Project:	Multiprogram Energy Laboratories Infrastructure Project Various Locations	2a.	Project No. MEL-001
		2b.	Construction Funded
3a. Date A-E Work Initiated, (Title I Design Start Scheduled):	Varies by subproject	5.	Previous Cost Estimate: Total Estimated Cost (TEC) -- N/A
3b. A-E Work (Title I & II) Duration:	6-12 Months		Total Project Cost (TPC) -- N/A
4a. Date Physical Construction Starts:	See subproject details	6.	Current Cost Estimate: TEC -- N/A
4b. Date Construction Ends:	See subproject details		TPC -- N/A

7. Financial Schedule: (Federal Funds)

Fiscal Year	Appropriation	Adjustments	Obligations	Cost
Prior Years	$ 27,856		$ 27,856	$ 20,000
FY 1995	21,247	-1,380 a/	19,867	16,858
FY 1996	27,449		27,449	26,000
FY 1997	21,260		21,260	27,000
Future Years	22,079		22,079	28,653

a/ Reflects $1,328,000 for this program's share of the Energy Supply, Research and Development reduction for use of prior year balances and $52,000 for the Departmental reprogramming.

23-822 96-42

1. Title and Location of Project: Multiprogram Energy Laboratories Infrastructure Project Various Locations

2a. Project No. MEL-001
2b. Construction Funded

8. Project Description, Justification and Scope (Continued)

	TEC	Prev.	Prior Year	FY 1995	FY 1996	FY 1997	Future Years	Start Date	End Date
Electrical Safety Rehab (PNNL)	4,740	6,800	0	240	1,500	1,500	1,500	4th Qtr FY 1995	3rd Qtr FY 1998

This project will provide for the rehabilitation of electrical systems and correction of numerous National Electrical Code (NEC) violations in various Energy Research buildings in the 300 areas of the Hanford Site.

Many of the buildings range in age from 20 to 40 years and electrical equipment and installations contained within them do not meet NEC and DOE standards and criteria for safe and efficient operations. This project will safeguard personnel working with the DOE facility electrical systems and enhance the reliability of those systems.

Multiprogram Laboratory Rehab, I (PNNL)	6,100	6,100	0	400	2,740	2,960	0	2nd Qtr FY 1996	4th Qtr FY 1997

This project is part of the Multiprogram Energy Laboratory - Facilities Support Program mission to modernize and renovate aging PNL multiprogram laboratory facilities. This project will involve the remodeling of the 3rd floor of building 331 and construction of a new facility for small animal quarters.

Leading research programs are increasing emphasis on cellular/modular studies and changing use of animal models for the dose-response studies to those which use in vitro/in vivo approaches. As a result, small animal physical facilities need to be renovated or replaced by additional laboratory facilities in which molecular biology and biochemical research can be carried out. This project responds to this new approach.

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
CAPITAL OPERATING EXPENSES & CONSTRUCTION SUMMARY
(Dollars in thousands)

	FY 1995	FY 1996	FY 1997	$ Change	% Change
Capital Operating Expenses					
Capital Equipment (total)	$500	$0	$177	$+177	-

Construction Project Summary (both Operating and Construction Funded)

roject No.	Project Title	TEC	Previous Appropriated	FY 1995 Appropriated	FY 1996 Appropriated	FY 1997 Request	Unapprop. Balance
MEL-001	Multiprogram Energy Laboratories Infrastructure Project	N/A	$27,856	$21,247	$27,449	$21,260	$22,079
Total Multiprogram Energy Laboratories - Facilities Support		$XXX,XXX	$27,856	$21,247	$27,449	$21,260	$22,079

PROGRAM DIRECTION

Mr Myers The headquarters average cost salary/fringe benefit cost for FY 1997 per FTE is $105,000 By contrast, the comparable field average shown is in the $81,000-$82,000 per FTE range. Given the fact that the headquarters grade level average is higher should not account for that kind of difference Further, this average FTE cost is considerably higher than many other headquarters organizational elements Provide appropriate detail which will serve to explain and justify such a high average FTE cost

Dr Krebs. The average salary/fringe benefit costs for FY 1997 are consistent with the grade levels of staff that manage the Energy Supply Research and Development programs for the Office of Energy Research at headquarters. The Energy Research programs encompass an unusually broad array of scientific and technical disciplines For the most part, for each scientific discipline or area, ER has only one scientist managing a large and complex, nation-wide, multimillion dollar research and development program Unlike other DOE program offices, ER manages its programs and provides technical direction to them from Headquarters; it would be too expensive to replicate in the field the many scientific disciplines represented in ER's programs The program managers have to be able to deal authoritatively on sensitive issues with leading scientists throughout the U.S. As a result, over sixty percent of ER's headquarters staff occupy senior positions, GS-14s and above Program implementation activities and related support, which are generally carried out by lower graded personnel, are accomplished in the field. The budget request for salaries and benefits includes all forms of personnel compensation including within grade step increases, overtime, cost of living and locality pay adjustments, and lump sum annual leave payments and reflects the comparatively high grade structure for Energy Research headquarters.

Mr. Myers. The headquarters average travel cost for FY 1997 is almost $6,000 per FTE Given that some number of the 254 FTEs will have limited-to-zero travel, provide detail which serves to validate and justify this level of cost per FTE.

Dr. Krebs. Energy Research programs and facilities are scattered throughout the U S., although program management responsibility for ER research and development activities resides in headquarters It is essential for ER's program managers to be able to visit the sites where the programs are being conducted and to attend major conferences and meetings involving their fields of science. It enables them to conduct program and construction project reviews, meet with their colleagues, share ideas, and remain cognizant of state-of-the-art scientific developments, which is essential if we are to maintain the scientific and technical excellence in our programs. Many of the latest new scientific facilities are being built in other countries. As a result, our programs have become increasingly international and international collaboration, which of course requires significant travel expenses, is essential to leverage U.S. research dollars and help keep U.S. scientists abreast of the latest world-wide scientific and technology developments.

Mr. Myers. The "Support Services" and "Other Related Expenses" accounts collectively represent in excess of $4.5 million of the total program direction request for FY 1997 Provide detail which identifies the cost elements comprising these categories. To the extent support service contracts represent part of the total, give such information by contract, task descriptions, deliverables, average man-years and estimated costs.

Dr. Krebs. The request includes $3.8 million for Energy Research Headquarters including $1.4 million for Other Related Expenses and $2.4 million for support services contracts. Other Related Expenses primarily cover acquisition of computer hardware and software for office automation and the costs of training and development for Energy Research staff. My comments in response to your earlier question regarding support services contracts at Headquarters in the General Science Program Direction decision unit also apply to the request for support services for Energy Supply Program Direction. The contractors I mentioned then perform the same services with the same deliverables for Energy Research's programs in the Energy Supply Research and Development appropriation. The Dyncorp contract provides an estimated 37 staff years of computer related support; the Dimensions, Inc., contract provides approximately seven staff years of administrative support including operation of the mailroom, travel processing and word processing; the META contract provides about four staff years of security related support and the Weston contract provides about 15 staff years of environment, safety and health technical support for the Energy Supply Programs. Of the remaining $700,000 of the $4.5 million request, $664,000 covers the costs of similar support to Energy Research funded staff under the Chicago Operations Office, and $36,000 is to support the staff at the Oakland Operations Office.

TECHNICAL INFORMATION MANAGEMENT PROGRAM

Mr. Myers. This section appears to represent the non-program direction portion of the OSTI operation in Oak Ridge. Identify where the program direction information is included.

Mr. Vivona. The program direction funding for the Technical Information Management Program is included in the separate Technical Information Management Program Direction budget that we inadvertently omitted in printing. Copies of the program direction budget have been forwarded separately.

Mr. Myers. Identify the FTEs and associated program direction costs for the OSTI operation for fiscal years 1995, 1996 and 1997.

Mr. Vivona. Funding for the Technical Information Management Program Direction budget is $10.2 million in FY 1995, $8.8 million in FY 1996 and $8.7 million for FY 1997. The budget funds 148 FTEs in FY 1995, 141 FTEs in FY 1996, and 135 FTEs in FY 1997.

Mr. Myers. The Life Sciences program is seeking a nominal $8 million increase for human genome activities associated with high throughput sequencing of human DNA. Provide a status of the program for the current fiscal year as well as for fiscal year 1997 to include a discussion for the requested increase.

Dr. Krebs. The goal of the DOE Human Genome program and of the U.S. and international Human Genome projects is to analyze, at the molecular level, the entire human genome, in other words, the DNA found in a typical human cell. To achieve this goal in a reasonable time and in a cost-effective manner requires the development of new biological research resources and technologies and improvements of existing resources and technologies.
With the completion in fiscal year 1995 of the high resolution physical maps of human chromosomes 16 and 19 by the Los Alamos National Laboratory and the Lawrence Livermore National Laboratory, and with the world-wide availability of mapping technologies and clone resources, DOE has reduced its support of mapping efforts and will continue to do so in fiscal year 1997. DOE continues to support the development of sequencing technologies for high throughput, cost-effective DNA sequencing. The most promising technologies are being subject to proof-of-principle testing. In fiscal year 1997, DOE will begin to scale-up and evaluate its most promising high throughput sequencing technologies. Full-scale production sequencing will be implemented by fiscal year 1998. However, development of even more economical, high-throughput sequencing technologies needs to continue.

The requested $8 million funding increase is needed for the continued evaluation and development of promising technologies for automated high-throughput production DNA sequencing. The improvements in DNA sequencing and automation technologies entering pilot production in fiscal year 1997 are likely to result in up to 10-fold increases in sequencing rates. During the evaluation and implementation of these new technologies, the fraction of the human genome that has been sequenced will be nearly doubled. However, greater improvements are necessary if we are to reach our goal of sequencing the human genome by 2006.

The current "Five-Year Plan for the U.S. Human Genome Project" jointly developed by DOE and NIH, and published in Science in 1993, has low cost high throughput sequencing as one of its primary goals. As stated in this plan, "substantial new technology that will allow sequencing at higher rates and lower costs is also needed." This type of technology development has been the hallmark of the DOE genome program since its inception. NIH has recognized DOE's contributions to sequencing technology by choosing a DOE National Laboratory (LBNL) and DOE sequencing technology as the site for its major Drosophila (fruit fly) sequencing project. It is essential that DOE continue to contribute the expertise and resources of its national laboratories to maintain current progress in the U.S. and international genome efforts.

Mr. Myers. Provide information which would describe the impact of not receiving the requested fiscal year 1997 increase.

Dr. Krebs. If the $8 million increase in funding is not provided, DOE will need to focus more of its current resources at those laboratories involved in high throughput sequencing. This refocusing will require the transfer of funds from those laboratories and projects not currently focused on production sequencing. Unfortunately, these cuts will reduce research on promising new technologies (whose potential cannot yet be evaluated) that could ultimately save hundreds of millions of dollars in sequencing costs.

ENVIRONMENTAL PROCESSES

Mr. Myers. The noticeable increase being requested relates to climate and hydrology activities - more specifically the addition of other atmospheric radiation measurement sites. Describe the requirement for this expansion and resultant expected benefits.

Dr Krebs There is no addition of other atmospheric radiation measurement sites to the program The Atmospheric Radiation Measurement Program has had all three sites since its inception, although the three are in different stages of completion. The funding increase requested is necessary to take these sites further along the path to completion, not to add new sites that are not already in existence. The data provided from each site are distinct from those measured at the other sites, and each set of data will be essential to resolving the critical questions raised by the role of clouds and radiation in understanding climate and the related implications to a national energy policy. The Southern Great Plains site near the Oklahoma-Kansas border is the most complete of the three sites and provides mid-latitude data. The Tropical Western Pacific site is the second site in terms of completion, and this will provide data at a location at which a significant portion of radiative energy enters the Earth's system. The North Slope of Alaska site is located where the Earth loses much of its energy, and this site has also been in development since the inception of the Program. This research has been coordinated with other U.S. programs, particularly those with the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, and the National Science Foundation.

ENVIRONMENTAL REMEDIATION

Mr. Myers. This program activity shows a nominal 60 percent increase in the funding profile over the fiscal year 's 1995-1997 time frame. Describe the value expected to accrue to the Government in fiscal year 's 1996-1997 from such steep increases in dollar resources.

Dr. Krebs. The bulk of the basic research activities supported herein are those directed towards the successor program to the Subsurface Science Program. Evolving naturally from the latter program, the increase in the new Natural and Accelerated Bioremediation Research Program is designed to investigate natural and accelerated ways to use bioremediation for cleanup at the Department's nuclear weapons production and processing sites. Bioremediation is the use of living organisms such as bacteria to degrade and detoxify, accumulate, or immobilize waste introduced into the Earth's surface. A central feature of the new program will be the

establishment of field research centers where successful laboratory-scaled research can be field-tested in a managed setting. If successful, this research program promises substantial reductions in the cost of environmental remediation of DOE sites.

Mr. Myers. Also provide detail on any perceived significant impacts should the fiscal year 1997 requested increase not be provided.

Dr. Krebs. Because of the long-term nature of the research, and the delay between research and technology implementation, most of the benefits of reduced cleanup costs will be accrued to the Government many years after the fiscal year 1997 time frame. If the requested budget is not provided, some of the research that is already ongoing at the Laboratories and in the universities will have to be eliminated, other research will be significantly delayed, and no new activities will be initiated in either the academic sector or the Laboratories. This will encourage the use of existing waste cleanup technology, already proven to be inferior and likely to be much more expensive than bioremediation will prove to be in the future as some experimental techniques are already suggesting.

RELATED CAPITAL FUNDING

Mr. Myers. The Department is requesting $23.7 million for new capital equipment acquisitions without any supporting detail or justification. Provide justification for the projects or acquisition requests.

Dr. Krebs. The capital equipment request of $23.7 million is required to support replacement of deteriorated and obsolete equipment at the laboratories and to acquire new, state-of-the-art equipment, particularly for human genome, structural biology, and carbon dioxide research. The Human Genome Program requires additional equipment for automating the preparation of DNA samples for sequencing and for building high throughput DNA sequencing devices. The Structural Biology program requires additional equipment for upgrading detectors and data management instrumentation at synchrotron and neutron beam facilities as well as laboratory instrumentation for visiting scientists at these user facilities. The structural biology requirements include $3.9 million associated with the Scientific User Facilities Initiative. The capital equipment monies required by the Atmospheric Radiation Measurement Program will be used to acquire instrumentation for the Atmospheric Radiation and Cloud Stations in the continental United States that will then be deployed at the Tropical Western Pacific and North Slope of Alaska sites. Monies are also required to support the Atmospheric Radiation Measurement Data System that feeds the data acquired at the three sites to the team of scientists funded by the Program, as well as providing the data to the scientific community at large. The request also includes funds to support Biological and Environmental Research landlord responsibilities at the Oak Ridge Institute for Science and Education.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH
Capital Equipment
($ Millions)

	FY 1997
Global Change/ARM	10.1
Structural Biology	7.0
Genome	2.7
Medical Applications and Measurement Science	0.4
CORE/General Purpose Equipment	3.5
Total	23.7

Mr. Myers. Is any of the $23.7 million for major items of equipment (MIE's)?

Dr. Krebs. None of the Biological and Environmental Research capital equipment is for major items of equipment (MIE's).

Mr. Myers. Project 91-EM-100: What projected uncosted and/or unobligated balances at September 30, 1995, might be made available for use to offset some portion of the requested fiscal year 1997 new budget authority.

Dr. Krebs. Project 91-EM-100 is the construction project for the Environmental Molecular Sciences Laboratory at Hanford, Washington. There are two primary components to this project: construction of the conventional facilities and acquisition of state-of-the-art equipment for the Laboratory, including many one-of-a-kind instruments that will likely not be duplicated elsewhere. Construction of the conventional facilities is on schedule and will be completed in September 1996. Thus, no uncosted and/or unobligated balances could be used for this aspect of the construction project. Consequently, the impact of the use of uncosted/unobligated balances will be on equipment purchase. This, however, leads to a significant risk that the Environmental Molecular Sciences Laboratory will not be able to fulfill its mission as a unique laboratory. The Environmental and Molecular Sciences Laboratory is not simply a building. It is a unified concept involving the physical facility, the scientific personnel, state-of-the-art and one-of-a-kind equipment, the availability of these unique resources to outside investigators, and an existing synergistic infrastructure at the Pacific Northwest Laboratory, all focused on the pursuit of molecular science based approaches to environmental remediation and restoration. It is the integration of all of these that will allow the Laboratory to fulfill its mission, and without such integration the frontiers in the fundamental science needed to improve the Nation's cleanup technologies will not be pushed forward.

Mr. Myers. Describe the accruing impacts on schedule as well as operational impacts should a $5 million reduction be made to the requested amount.

Dr. Krebs. A number of factors went into the decision by the Department and by the Congress to support construction and operation of the Environmental Molecular Sciences Laboratory. First, the fundamental molecular science that can be exploited to develop new, efficient, and cost-effective technologies for cleanup of the Department's sites is lacking. Second, the interdisciplinary nature of the research leading to these fundamental discoveries requires collocation of the scientists involved in the research. Third, no advances will be made without state-of-the-art equipment and one-of-a-kind equipment that will be used on a daily basis by teams of scientists from a variety of disciplines focused on the complex issues posed by the cleanup. Thus, an integral part of the Laboratory and its value to the Nation is the equipment to be contained therein. A $5 million reduction in the Laboratory budget at this time would eliminate the acquisition of equipment necessary to the development and testing of such things as new catalytic materials that will be effective in sequestration of nuclear contaminants, as well as new materials necessary for the development of sensors that will monitor worker safety or monitor the state of restoration of cleanup targets without putting workers in dangerous settings. Another research arena that will be severely impacted is the focused understanding at a molecular level of

the biological consequences of exposure to radioactive compounds and other chemicals used in the production of nuclear materials. The Laboratory was also designed, developed, and constructed as a unique national collaborative user facility that provides a suite of instrumentation and intellectual resources to scientists across the academic, federal, and private sectors. A reduction in the budget will eliminate most of the instrumentation that allows scientists across this Nation to access the instrumentation remotely, while remaining in their home laboratories. The result of a $5 million deferral in funding would be more than simply a delay in the acquisition of such pieces of equipment. The development and purchase of all equipment not currently acquired will be under contract by the end of FY 1996, and there will be penalties to contract extension or termination, as well as price increases for many instruments in future years. Many of the instruments undergo significant price increases on annual, if not semi-annual, bases. Thus, a future restoration of $5 million dollars would not provide for the purchasing power of $5 million in FY 1997.

Mr. Myers. Provide similar information assuming a $10 million reduction from the requested fiscal year 1997 funding level.

Dr. Krebs. A reduction of $10 million will have even more severe impacts than those stated above for a $5 million impact. Such a reduction will limit the range of scientific areas that the Laboratory can fully pursue as it strives to achieve its mission to provide the fundamental molecular science that underpins the solution to our environmental challenges. Two pieces of the equipment and instrumentation package in the Laboratory must be commented on explicitly. The GigaHertz Nuclear Magnetic Resonance Spectrometer that has been designed and developed for the Laboratory is not only a unique instrument, but it is one that represents such an advance in technology and scientific capabilities that it is awaited eagerly by the entire magnetic resonance community. The High Performance Computing System will build significantly on the Department's scientific computing capabilities by providing the most advanced system that has just become commercially available and that is essential for the complex computational issues involved in cleanup research. If these two systems are to be maintained under a $10 million reduction, all other aspects of the project instrumentation will be affected. The unique suite of mass spectrometers that will enable detection of perturbation due to environmental insult of biological compounds at lower levels than previously detectable will be incomplete, the consequence of which may be severe to our understanding of the health impacts of the Department's contaminated lands. All equipment necessary to enable remote access of any Laboratory capabilities will be eliminated. Most other suites of instruments will remain incomplete, in some cases putting into question the full utility those instruments that are in place.

If the project period is increased, the science performed in the Laboratory will be delayed, and this will encourage the use of cleanup technologies that have already proven to be costly and of marginal effectiveness for longer periods of time.

FUSION AND PLASMA SCIENCE

Mr. Myers. Describe how the fusion and basic plasma science activities in this category are being redirected to support the FEAC report recommendation.

Dr. Krebs. The Office of Energy Research has accepted the Fusion Energy Advisory Committee (FEAC) recommendations and has moved promptly to implement them in the proposed fiscal year 1997 budget. The central theme of the fusion energy sciences domestic program will now be the development of fusion science, enabling technology and plasma confinement innovations. With increased funding for operations at the three major tokamaks, the Tokamak Fusion Test Reactor, DIII-D, and Alcator C-Mod, the program will explore innovative ways of designing and operating tokamaks. Additional funding will be made available for exploring alternatives to the tokamak concept, some already being pursued at sub-optimal levels, and, hopefully, some totally new ideas that will broaden the scope of the program. Because of the broad importance of theory and modeling research on new approaches to improving computational capability will be initiated in coordination with other DOE program offices. New diagnostics that will contribute to a deeper understanding of experiments will be placed on fusion facilities.

A basic plasma science initiative will be directed at specific recommendations in the FEAC report. The Office of Fusion Energy Sciences will assume a leadership role within the government in promoting plasma science. Specific activities include coordinating plasma science research within the Department of Energy, with other government agencies, such as the National Science Foundation and the National Aeronautics and Space Administration, and maintaining and broadening the academic base of basic plasma science. These activities also represent a significant step toward implementing the recommendations in the 1995 National Research Council Report on Plasma Science.

Mr. Myers. This category shows a significant increase (13.3%) from the fiscal year 1996 adjusted level with $8.1 million of the increase attributed to tokamak physics and $5.6 million of the increase to support alternative confinement concepts. What specific program impacts would result from failure to provide this level of increase - i.e., maintaining the funding level at a nominal $141 million level.

Dr. Krebs. In response to the Fusion Energy Advisory Committee (FEAC) report to emphasize scientific understanding and concept improvement in the ongoing tokamak experiments, the $8.1 million increase in the tokamak physics category permits increased operation of our three major tokamaks (Tokamak Fusion Test Reactor, DIII-D, and Alcator C-MOD) to explore innovative ways to operate and design tokamaks. This allows us to take advantage of the previous investment made in these facilities and the existing infrastructure in advancing fusion science. These tokamak programs also plan to increase collaborations with universities in order to further enhance scientific output. Without the proposed funding increase, a central thrust of the FEAC report that argued for greater use of existing facilities to support scientific discovery would be seriously undermined. Furthermore,

these facilities would continue to be underutilized resulting in the need to consider termination of at least one of them, cutting off or limiting research on exciting new scientific phenomena such as alpha-channeling and reverse shear.

The proposed increase in funding for alternative concepts will allow modest increases in support for ongoing small world-class experiments. The scope of the alternatives program will be broadened by exploring new concepts starting in fiscal year 1997. Without this funding increase, we would be unable to respond to FEAC's recommendation for a broader investigation of alternatives to the mainline tokamak experiments, as was specifically advocated in congressional guidance.

FUSION TECHNOLOGIES

Mr. Myers. About 65% of the FY 1997 request is in support of the ITER engineering design activities. Can this level of support be reduced (and by how much) while still achieving the goal of successful partnering in the international effort.

Dr. Krebs. The International Thermonuclear Experimental Reactor (ITER) Engineering Design Activities (EDA) support level for fiscal year 1997 cannot be reduced while still achieving the goal of successfully partnering in the international effort. The U.S. support of ITER has already been reduced from $69.5 million in fiscal year 1995 to $55.0 million in fiscal years 1996 and 1997. The fiscal year 1996 and 1997 levels are considerably below the baseline project plan. The planned level in fiscal year 1996 of $83.0 million was reduced to $55.0 million. The fiscal year 1997 request level provides for no increase over the fiscal year 1996 level. The fiscal year 1997 request is consistent with the recommendation of the Fusion Energy Advisory Committee based upon this discussion with our ITER EDA partners that stated that "Further withdrawal from the ITER EDA would severely strain the relationship with our partners, complicating any attempts to strengthen science and technology collaborations with them in other areas." The reduction in FY 1996 precipitated extended discussions with the ITER Director and the other ITER Parties to accommodate the financial restrictions on the U.S. ability to carry out certain design and R&D tasks An accommodation, including consideration of the fiscal year 1997 budget request, has been worked out without serious damage to the project or to other Parties who were working closely with the U.S. on ITER tasks. Any further reduction in U.S. support will jeopardize the successful completion in fiscal year 1998 of the ITER Final Design Report, to which the U.S. is committed.

RELATED CAPITAL FUNDING

Mr. Myers. Describe the impact of not receiving the proposed increase. Provide impacts on the two indicated projects.

Dr. Krebs. The loss of the requested capital equipment funding for the DIII-D tokamak ($3.3 million) would delay completion of the DIII-D heat and particle removal (divertor) system, thereby postponing an important component of the DIII-D physics program that is needed to provide an integrated test of advanced physics features. The loss of the requested capital

equipment funding for the National Spherical Tokamak Experiment ($5 million) would delay the start of component fabrication for the National Spherical Tokamak Experiment (NSTX) at Princeton--a modest size, scientifically aggressive experiment that is a principle component of the Department's response to the Fusion Energy Advisory Committee's recommendations to reinvigorate the U.S. fusion science program. It is the only new experiment in the fiscal year 1997 budget proposal and its loss or postponement would undermine confidence in the new fusion research strategy. With the planned shutdown of the Tokamak Fusion Test Reactor, the NSTX is essential to providing a scientifically aggressive new machine that would take advantage of the Princeton Plasma Physics Laboratory infrastructure, allowing the laboratory to be the intellectual focus of fusion science in the U.S., as envisioned by FEAC.

With the termination of the Tokamak Physics Experiment, there are no new facilities being constructed for fusion research. This means that new research capability can only come from upgrades of existing devices like DIII-D and fabrication of small-scale experimental hardware like the NSTX at Princeton, or other smaller proposals being considered at various universities. That makes the two projects identified here essential to allowing progress in fusion science to continue in the future.

BASIC ENERGY SCIENCES

MATERIALS SCIENCES

Mr. Myers. Provide detail on the total amounts included in the FY 1997 request for the conceptual design report, the environmental impact statement and all other preconstruction activities related to the spallation neutron source.

Dr. Krebs. The total amount for all of these activities for the 1 megawatt Short Pulse Spallation Source at ORNL is $8 million. Essentially all of these funds are for the conceptual design report. The breakdown is as follows: design - $3.3 million, research and development on ion sources, accelerators, and target concepts - $4.2 million; environmental impact statement $500 thousand.

Mr. Myers. Also, when will the CDR be complete with information on both a total estimated cost (TEC) and a total project cost (TPC)?

Dr. Krebs. The conceptual design report will be completed at the end of fiscal year 1997. At that time, the complete information on total estimated cost and total project cost will be available.

Mr. Myers. Describe what "partnering" possibilities may exist with Defense Programs regarding an objective of optimizing the resources of the Department in materials sciences activities. At this point the Department has essential separate programs in the materials sciences area which, on balance, appears less than cost effective.

Dr. Krebs. Energy Research's materials sciences funding supports the civilian missions of the Department. This research does not deal with specific weapons related materials so it is not directly relevant to nuclear weapons. However, concepts, data, instruments, and techniques are used by DP researchers. The objective of the Materials Sciences subprogram in Energy Research is to develop the fundamental understanding needed to explain and exploit the various properties of materials across a very broad range of possibilities. Included in this activity are investigations into superconductivity, magnetism, surface science, thermodynamics, solidification, residual stress, photovoltaic effects, mechanical properties, erosion and wear, tribology, polymers, electronic structure, and the development of the experimental techniques to study these properties. Another very important component of the materials science activity in Energy Research is the synthesis and processing of new materials, and modification of existing materials with the objective of optimizing the properties that such materials might have. The knowledge obtained from this fundamental basic research underpins a wide variety of applications, including those concerned with energy and environmental applications and those of importance to Defense Programs.

The objectives of the Defense Programs activity in materials science are very strongly focussed on certain "exotic materials" such as uranium, plutonium, and beryllium for weapons applications or for electronic devices needed in connection with the weapons program. Many of the research techniques developed in the materials sciences with the support of the Office of Energy Research have been found to be useful for Defense Programs purposes. But there is very little overlap between the objectives of the two programs, overlap between the customers for the knowledge obtained in each case, or overlap in the actual research that is carried out.

The following examples describe the "partnering" that occurs at several levels.

On a department-wide basis, coordinating of materials research and development activities takes place in the Energy Materials Coordinating Committee (EMaCC). The Division of Materials Sciences and Defense Programs are represented on the Energy Materials Coordinating Committee and its subcommittees on Semiconductors (includes photovoltaics), Superconductivity, Electrochemical Technologies (includes batteries and fuel cells), and Structural Ceramics

Coordination is realized through the siting of some Materials Sciences programs at Defense Programs laboratories: namely, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory/New Mexico and Sandia National Laboratory/California. Siting of some programs at Defense Programs laboratories enables the Materials Sciences program to exploit scientific and technical expertise at these laboratories and to conduct a more comprehensive program of scientific inquiry. Siting of Materials Sciences programs at Defense Programs laboratories provides these laboratories with a core of personnel who are actively engaged in forefront research in materials science. These scientists are sources of fundamental insights on new problems and guidance to the development of new material systems. Defense Programs laboratories compete on an equal basis in all Energy Research requests for proposals. The results of all Energy Research materials research are available in open-literature publications. Facilities supported by Energy Research are available to Defense Programs researchers.

A major "partnering" activity currently underway between Defense Programs and Energy Research is the development of the Los Alamos Neutron Science Center. Defense Programs sees the capability of the Los Alamos Neutron Science Center for neutron radiography of weapons components as very important to their Science-Based Stockpile Stewardship effort. At the same time, Energy Research/Division of Materials Sciences sees the opportunity to enhance the neutron scattering capabilities for fundamental research at Los Alamos Neutron Science Center far above the under-developed capabilities it has had for the past decade. The Los Alamos Neutron Science Center received a major boost in the FY 1996 budget under the Scientific Facilities Initiative and Energy Research is hoping to build on this increased level of operations to serve the user community far better in FY 1996 and beyond. Defense Programs and Energy Research are sharing the responsibility for support of research and development on common problems for a new spallation neutron source which is a high priority for Energy Research, whereas Defense Programs is interested in the accelerator production of tritium. An Energy Research-Defense Programs workshop on joint research and development between Accelerator Produced Tritium and Spallation Neutron Source was held last summer. Los Alamos is participating in both accelerator produced tritium and spallation neutron source research and development. Los

Alamos National Laboratory is part of the interlaboratory effort on the spallation source that also includes Brookhaven National Laboratory, Lawrence Berkeley National Laboratory and Oak Ridge National Laboratory Oak Ridge National Laboratory is responsible for the project.

Sandia National Laboratory coordinates the Center of Excellence for Synthesis and Processing program of the Division of Materials Sciences This distributed center involves 12 Department of Energy laboratories including the three principal Department of Energy/Defense Programs laboratories in seven integrated and coordinated focus topics:

Metal Forming
Materials Joining
Tailored Microstructures in Hard Magnets
Processing for Surface Hardness
Mechanically Reliable Surface Oxides for
High-Temperature Corrosion Resistance
High Efficiency Photovoltaics
Microstructural Engineering with Polymers

Sandia/New Mexico is collaborating with National Renewable Energy Laboratory on the properties of composition-modulated III-V semiconductor alloys Sandia's interest is in the semiconductor architectures having enhanced light emission properties for lasers and infrared detectors, whereas National Renewable Energy Laboratory's interest is in semiconductor architectures for high efficiency visible light absorption for solar cell applications. This project combines Sandia's strength in Molecular Beam Epitaxy and magneto optical studies of strained-layer systems with National Renewable Energy Laboratory's leadership in theory and optical spectroscopy or ordered semiconductor alloys. This combined effort is addressing specifically the phenomena of phase separation/composition modulation in alloy systems such as AlInAs, AlGaAs and GaInP which can be grown by Molecular Beam Epitaxy to exhibit periodic compositional waves ("compositional modulation") This phenomenon has been found to result in band gap reduction and carrier localization and is expected to be useful as a means to alter material properties

The relative levels of support*(based on FY 1994-95 levels) are:

	Defense Programs-materials	Energy Research Div. Materials Sciences
Sandia National Laboratories	$32.2 M	$8.0 M
Lawrence Livermore Nat'l Lab	$19.0 M	$3.1 M
Los Alamos Nat'l Laboratory	$27.0 M	$7.3 M

* Energy Materials Coordinating Committee report of 7/31/95 (excludes support for Los Alamos Neutron Science Center at Los Alamos National Laboratory)

MATERIALS SCIENCES

The Defense Program commitment is undoubtedly more applied, and focussed on weapons production, safety, and operation, as well as the Defense Programs effort on specialized semiconductor devices carried out at Sandia. Since every technology is materials-limited, it is not

surprising that Defense Programs has mounted a specialized activity on materials problems that need to be solved for their particular needs It can be stated with a high degree of confidence that there is very little overlap between the two activities. When opportunities do arise to work together, Energy Research and Defense Programs have done so.

Below are a few examples of coordinated Basic Energy Sciences/Materials Sciences and Defense Programs efforts at a few laboratories:

Basic Energy Sciences/Materials Sciences Research at Lawrence Livermore National Laboratory has shown that the ideal laser excitation efficiency for the Defense Programs/Internal Confinement Fusion National Ignition Facility will exceed 98% :

Development of the National Ignition Facility is being pursued by the Department of Energy as an important component of Science Based Stockpile Stewardship for the safe and reliable storage and readiness of nuclear weapons, for high-energy density physics explorations and as a potential future inertial confinement fusion energy source for civilian applications. The National Ignition Facility laser design uses 192 beams generated by a flashlamp neodymium-doped glass lasers, whose design must be carefully verified. Defense Programs and Inertial Confinement Fusion have sponsored the Lasers Program at Lawrence Livermore to develop computer codes that include all relevant physics and engineering issues such that the performance of the laser can be predicted and also optimized (to reduce cost). The codes must properly represent the laser physics and contain the appropriate input data and parameters. One of these, which can effect the output energy of the laser, is a fundamental physics input parameter known as the neodymium lower level lifetime.

The lower level lifetime can affect the output energy of the laser. Energy initially residing in the upper laser level of the Neodymium ions (in the laser glass) is forced to the lower laser level by stimulated emission -- thereby amplifying the intensity of the laser beam. An additional complication arises, however, because the energy can become "bottlenecked" in the lower laser level. Bottlenecking occurs when the lower level lifetime is longer than the pulse length of the laser. The bottleneck effect can lead to a reduction in the laser efficiency and pulse shape are critical to the success of achieving fusion ignition, the impact of the lower level lifetime must be carefully considered. The results from this research have relevance to civilian technologies such as ultraviolet-transmitting windows (e.g. as applied to ultraviolet lithography), and the efficiency and design of laser technologies (e.g. for medicine, remote sensing, pollutant detection, and telecommunications).

Collaboration between Defense Programs and Basic Energy Sciences programs resulted in Basic Energy Sciences investigating and evaluating this important parameter. Basic Energy Sciences researchers devised and executed a novel experiment to assess the Nd lower laser lifetime in Nd:glass and used this information to convincingly model the effect of laser pulse length on the extraction efficiency of the type of laser amplifiers to be employed in the National Ignition Facility.

Basic Energy Sciences/Materials Sciences Welding Research at Lawrence Livermore National Laboratory to use Defense Programs beamline at Stanford Synchrotron Radiation Laboratory: The role of welds and their performance in modern fabrication activities, including those in weapons systems under the purview of Defense Programs, is one of great importance. Furthermore, weld failures are the most common type of failure in electric utility power plants, with nonnuclear power plant weld failure costing on the average over one million dollars annually according to the Electric Power Research Institute. Much of Lawrence Livermore National Laboratory's development and analysis is based on empirical iteration and individual skill, due to an incomplete understanding of the evolution of the material structure and properties during the process. A collaboration between Defense Programs and Basic Energy Sciences has led to the development of diagnostic techniques based on synchrotron radiation which are allowing our scientists to access, in real time, detailed information about the evolution of the materials microstructure in the region of the weld. This information will enable substantial improvement in our ability to model welding processes and predict the properties of those welds.

This development was possible only because of the confluence in the same place and the same individuals of developments in synchrotron beamline capability and X-ray diffraction techniques of interest to Defense Programs, and to fundamental interest in building a scientific understanding of welding processes by both Defense Programs and Basic Energy Sciences. The Stanford Synchrotron Radiation Laboratory is a Basic Energy Sciences user facility, in which Defense Program built the beamline and executed part of the development of the spatially resolved X-ray diffraction technique which depends on the very high brightness and tunability of a synchrotron source. Basic Energy Sciences is now executing a fundamental program using these developments to further the modeling and scientific understanding important to both offices. This would probably not have occurred if the same individuals had not been involved in both efforts.

Chemical Vapor Deposition is a widely used process for growing thin films and coatings necessary for the Defense Programs mission:

Chemical vapor deposition is a widely used process for growing thin films and coatings of interest to a wide variety of Department of Energy applications (microelectronics, photovoltaics, corrosion-resistant coatings, etc.), that are critical to the success of the Department of Energy mission, but it has been an empirical trial and error process. Basic Energy Sciences/Materials Sciences supported research has lead to a detailed understanding and modelling of the gas phase and surface phenomena involved and to the development of in-situ optical diagnostics and novel rotating disk reactor designs which allow accurate, on-line control of composition, structure and thickness during growth. This understanding and these tools have been crucial to Defense Programs funded programs in microelectronics for the growth of compound semiconductor vertical cavity surface emitting lasers. A good agreement has been obtained between computer simulation and experimental flow patterns for Sandia designed rotating disk Chemical Vapor Deposition reactor.

Basic Energy Sciences/Materials Sciences developed Strain-layer Superlattices which Defense Programs now uses for improved weapon safety, security and control:

Basic Energy Sciences/Materials Sciences supported research at Sandia National Laboratories led to the concept and subsequent development of strained-layer semiconductor superlattices. Strained-layer semiconductor superlattices consist of very thin (tens of Angstroms thick) alternating layers of different lattice mismatched materials (e.g., gallium arsenide, GaAs, and gallium phosphide, GaP) They are a new class of man-made materials with unusual, tailorable electronic and optical properties not found in normal semiconductors. They are revolutionizing optoelectronics device technology worldwide. These strained-layer semiconductor superlattices were first grown and later perfected at Sandia National Laboratories using state-of-the-art molecular beam epitaxy and metal organic chemical vapor deposition apparatus made available by the support of Defense Programs Using these materials, novel optoelectronic devices such as Vertical Cavity Surface Emitting Lasers were developed under the support of Defense Programs These devices were developed for application in improved weapon safety, security and use control. This work has received two major awards: (1) The 1985 Department of Energy Lawrence Award in Materials Sciences, and (2) The 1993 International New Materials Prize given by the American Physical Society.

Superplastic forming:

The superplastic forming technology developed at Oak Ridge National Laboratory and under Defense Programs support has made a significant impact on the manufacture of nuclear weapon components by facilitating reductions in material requirements of up to 60% when compared with conventional forming techniques. Superplastic forming technology also permits the lowest cost and lowest waste by-product fabrication of formed metal components for transportation (vehicular, planes) applications. A critical aspect of the successful implementation of this technology is the accurate modeling of the forming process because this enables components to be simulated before tooling and materials are expended on trail experiments. This simulation process necessitates an accurate constitutive model to capture the material behavior during the deformation process. Up until now, the models implemented have not tracked the influence of prior deformation history on the response of the material during superplastic deformation. Current research efforts of the Basic Energy Research Program at Oak Ridge National Laboratory are directed at developing an internal state variable model which captures prior strain effects for this application. Improved predictive capability is anticipated through these efforts which will allow more accurate process simulation and manufacturing process control. Similarly, fundamental research on superplastic deformation mechanisms is underway to develop a material model which can explain the large deformations achieved in superplasticity which other existing theories have failed to do adequately so far. Through this research, a better understanding of the mechanisms responsible for superplastic deformation will facilitate developing more ideal, tailored superplastic materials for a specific application. The science will drive the improvements in the applied technology.

MATERIALS SCIENCES

Giant Magnetoresistance:

Basic Energy Sciences research on first principles theory of materials is contributing to investigations of the giant magnetoresistance effect in layered transition metal alloy systems for the purpose of understanding and optimizing this effect for application to magnetic data storage devices. Basic Energy Sciences contributions to this research effort stem from over twenty years of development of alloy theory, transport theory, and the theory of magnetic materials. This research includes collaborations with Lawrence Livermore National Laboratory and Sandia National Laboratories/New Mexico. Relative to Defense Program needs, this research will help to:

(1) develop understanding of magnetic multilayer systems so that they may be used to build static radiation and electromagnetic pulse resistant magnetic memory devices suitable for Defense Programs applications, and

(2) advance the art of parallel processing at DP laboratories by applying novel computer architectures to frontier problems in materials modeling.

Basic Energy Sciences theoretical research also has implications for spin dependent tunneling, a technology with potential implications for Defense Programs technologies for sensors and to revolutionizing the data storage industry by providing a nonvolatile, radiation resistant, storage device that is cheaper than disk storage and faster and much more reliable than current semiconductor memory.

Defense Programs funding of significant materials characterization facilities utilized by Basic Energy Sciences/Materials Sciences programs:

All of the Basic Energy Sciences/Materials Sciences programs utilize the new Electron Microscopy Laboratory at Los Alamos. Defense Programs funded the new building space and the state-of-the-art electron microscopes. These microscopes have supported major new advances in our fundamental understanding of materials on the Division of Materials Sciences programs. One example is the exciting new approach to designing radiation resistant materials based on metal ceramic composites. The ability of these microscopes to examine materials at the atomic level has played a major role in this development of the Neutron Induced Metastable Structures program.

Results of Basic Energy Sciences/Materials Sciences studies incorporated into Defense Programs weapons programs:

Materials are subjected to multi-axial deformation during industrial metal forming, car accidents, launching and impact of munitions, and ignition of nuclear weapons. Developing a fundamental understanding of how materials deform under these real world conditions is the focus of this Division of Materials Sciences program. One of the critical aspects of understanding how materials deform is materials texture. This program has made significant advances in our

understanding of materials texture. Two specific results of this research have been incorporated in Defense Programs weapons programs. How materials properties depend on texture and how texture evolves during deformation are advancing Defense Program's understanding of high Z materials such as tantalum.

A Further Example: Magnet Lab

The National Science Foundation National High Magnetic Field Laboratory program at Los Alamos uses infrastructure from both Defense Programs and Energy Research programs. The principal Defense Programs infrastructure consists of the existing magnetic flux compression capabilities developed for Defense Programs program needs, the capabilities developed by Defense Programs in fast instrumentation and diagnostics, and the building that houses the magnets an staff.

Defense Programs utilizes the National High Magnetic Field Laboratory infrastructure for common research interests. Defense Programs do preliminary tests as users at the National High Magnetic Field Laboratory and utilize National High Magnetic Field Laboratory and its science community to participate in explosive extremely high magnetic field (500T) science experiments.

National High Magnetic Field Laboratory utilizes the large generator and power supply building built by Energy Research for the canceled ZTH fusion experiment.

The initial Energy Research investment in the generator and power supply building is now being returned to Energy Research through their establishment of the 100T magnet project. There is also a synergy with the National Science Foundation which is installing the power supplies to drive the 100T magnet as a part of its National High Magnetic Field Laboratory program agenda There are common science needs with no significant program responsibility overlap.

In summary the National High Magnetic Field Laboratory is at a triple point of science synergy between Defense Programs, Energy Research, and the National Science Foundation with significant research and development integration and no significant program responsibility overlap.

We have numerous other examples of coordinated efforts between Basic Energy Sciences/Materials Sciences and Defense Programs where the total results output has been enhanced by this interaction.

ENGINEERING AND GEOSCIENCES

Mr. Myers. Provide any substantive impacts in FY 1997 of being funded at no more than the FY 1996 level of $38.8 million.

Dr. Krebs. During the past two years the collaborative research among university and laboratory researchers funded by DOE, and researchers in the oil and gas industry, has moved forward on a basis of evolving trust and understanding. We are now at the critical stage where we can take advantage of this opportunity to develop new understanding of fluid migration in deep-seated oil and gas reservoirs based on computationally intensive analysis and interpretation of three-dimensional structure and properties. The core of the proposed expansion is geophysical imaging and interpretation coupled with prediction of fluid flow using advanced computational and modeling techniques developed in the Nation's universities and Departmental laboratories. Participation of oil and gas industry-funded researchers is essential if we are to move forward in a meaningful fashion to provide the foundation for enhanced production of domestic oil and gas resources. In short, constant level funding would result in a loss of momentum in bridging the gap in basic research between government and industry-funded researchers and we would miss a unique and important opportunity.

RELATED CAPITAL FUNDING

Mr. Myers. The capital equipment, although down from the Fiscal Year 1996 level is almost 15% above the FY 1995 funding level. Provide any substantive impacts to the various programs of being restrained to no more than the FY 1995 funding level.

Dr. Krebs. The capital equipment increase of almost 15% from FY 1995 to FY 1997 is due to funds provided for the Scientific Facilities Initiative. Some funds under the initiative were allocated to capital equipment in recognition of the need to begin to build new beamlines and upgrade existing beam lines at the facilities to provide the capability needed to carry out cutting edge research programs. Much of this is being done in collaboration with users receiving funds from other Federal agencies like the National Science Foundation or the National Institutes of Health or the private sector. If this increased level of funding is not continued commitments will not be met and the facilities will never reach nor be maintained at the research capability needed and planned under the Scientific Facilities Initiative, and much of the FY 1996 additional investment will not be realized.

Mr. Myers. Provide the impact(s) of not receiving the requested $2.8 million increase in the general plant projects area. Be specific as possible relative to project impacts.

Dr. Krebs. The requested $2.8 million increase in the general plant projects area (GPP) results from the increased landlord responsibility acquired by Basic Energy Sciences in FY 1996. In FY 1996 responsibility for funding general plant projects at Oak Ridge National Laboratory was transferred to Basic Energy Sciences by Congress without funds. Nevertheless, the Basic Energy Sciences Program provided Oak Ridge National Laboratory a total of $1.29 million in new budget authority in FY 1996. This compares to B/A for Oak Ridge National Laboratory of

$6.9 million for general plant projects in FY 1995. The Basic Energy Sciences' request for Oak Ridge National Laboratory in FY 1997 is for $3.29 million. If the requested increase is not provided, $2 8 million of critically needed GPP will not be funded at the laboratories the Basic Energy Sciences Program has landlord responsibility for.

CONSTRUCTION

Mr. Myers. Project 96-E-300: Describe what FY 1997 commitments in terms of contacts, in-house labor, etc. are planned with the $9.0 million being requested.

Dr. Krebs. Construction work on the experimental wing of the Combustion Research Facility will recommence in FY 1997 with approximately $8.0 million in contracts for installation of plumbing, electricity, heating, air conditioning, special exhausts, walls and such. Approximately $1.0 million will be for in-house labor which will include design for the specific experimental capabilities that will be installed in FY 1998 and FY 1999. The experimental capabilities planned for the Combustion Research Facility will allow enhanced basic research in the chemistry of combustion which will be integrated with research on combustion systems supported by the Energy Efficiency and Fossil Energy research programs of the Department. For example, advanced diagnostics methods developed under the basic research programs of the Department can be applied almost immediately in collocated, applied research programs

Mr. Myers. Also provide information relative to what lower level of new budget authority would suffice with some minimum level of impact to project schedules.

Dr. Krebs. Construction of Phase II of the Combustion Research Facility was begun in FY 1987 as Project No. 87-R-405. $0.3 million was allocated for this project in FY 1987 and $4 5 million FY 1988. At this point, the building foundation and shell had been completed and work was underway for design of the experimental facilities to be built in the facility. Since that time for reasons varying from year to year, no further work was performed on this project Because of anticipated budget constraints, the construction budget has been stretched during the past three years from a $9.0 million per year two year schedule to a $5.0 million, $9 0 million, $6 0 million three year schedule to the present $2.0 million, $9.0 million, $7.0 million, $4.0 million four year schedule. Inflation continues to drive the total cost up.

Construction was recommended as Project No. 96-E-300 in FY 1996 with $2.0 million. Because the science and technology have progressed considerably since the project was begun, some of the FY 1996 funds will be spent in workshops and consultations with the scientific user community on the experimental facilities to be built. The user community has been losing confidence in the project over the past 10 years and with the restart of the effort, confidence is beginning to return. Further project delays or reductions in funding will seriously erode the confidence of the scientific community in the Federal Government's commitment to completing this project.

UNIVERSITY AND SCIENCE EDUCATION

Mr. Myers Explain how the appropriated dollars for the Laboratory Cooperative Program are expended in terms of cost elements (i e grant instruments, other contractual type instruments, etc.).

Dr. Krebs. Funding for the Laboratory Cooperative Program is placed in the Department's Financial Plan for each laboratory. The program is the primary vehicle for providing faculty and students with access to summer and semester hands-on research opportunities at the Department's national laboratories The funding provides stipend/salaries for faculty and student research participants In addition, these provide for the coordination of the placement of these participants in research areas at the laboratories.

Mr. Myers Also, what is the process for deciding what institutions participate and at what funding level(s).

Dr Krebs Individual DOE laboratories and facilities submit annual Field Work Proposals (FWPs) outlining the activities for which they are requesting support These documents are reviewed by the program and funding decisions are based on the available scientific resources of the laboratory, the past performance of the individual laboratory, and the available program dollars Students and faculty from all colleges or universities are eligible to apply for an opportunity to participate in one of these Laboratory programs on a competitive basis. Program information and application forms are provided to university departments throughout the United States through on campus counselors, mail and personal referrals In addition, program information is provided over the Internet and the World Wide Web. Selections are competitive based on established criteria, e g grade point average of 3 0, U S citizen or permanent resident alien, sophomore or higher standing, matching the research available at the laboratories with the research interest of the applicants.

UNIVERSITY PROGRAM

Mr. Myers Please describe the perceived utility of this program to the Government

Dr. Krebs. The University Program supports university-based efforts directed at encouraging more young people, including minorities and women, to pursue DOE-related scientific and technical careers The program also sustains DOE laboratory/minority university alliances as well as other Administration and Congressionally recommended efforts This activity is in support of the Department's mission to enhance the development of a diverse, well-educated and scientifically literate workforce needed to accomplish our overall scientific objectives

The Pre-Freshman Enrichment Program (PREP) currently funds 46 colleges and community colleges to introduce science and math-based activities to grades 6 through 10 students from minority communities. These grants are cost-shared with local business and industry.

The Distinguished Postdoctoral Research Program was supported at a funding level of $1.1 million for FY 1996. The program currently has 18 participants The appointments are for three years and the program is scheduled to terminate in FY 1998.

Mr. Myers. What indices does the Department have and utilize to measure the success (or failure) of this level of taxpayer investment?

Dr. Krebs. The Department contracted with evaluation experts to develop evaluation tools and indicators to be used for improving science education programs in the Department of Energy. Performance measures for the University Program are both qualitative and quantitative. Among the indicators, measures of the quality of the program will include: improved flow of underrepresented students into science and math programs/careers achieved; and cost sharing for these hands-on research experiences.

Mr. Myers. How much of the FY 1996 and FY 1997 levels are targeted for HBCU's and are these amounts in addition to the Departments other HBCU program(s)?

Dr. Krebs. In FY 1996, a total of $2 14 million was provided to HBCUs. These dollars are one important component of the Department's HBCU program that includes support from each major program office of the Department The target levels for FY 1997 are in the process of being established.

COMPUTATIONAL AND TECHNOLOGY RESEARCH

Mr. Myers Provide the detail on the requested $24.3 million (object class 41.0) for grants, etc. Show by specific cost element. Provide detail on the requested $49.4 million for "All Other Sites".

Dr. Krebs. Attached is a breakdown of the $24.3M, including an undesignated amount of funds that will be awarded through competitive solicitations, including funds for DOE 2000.

The requested $49.4 million for "All Other Sites" is comprised of funding of $24.3 million for grants, $0.4 million for interagency agreements, $3.8 million for SBIR, $0.6 million for Support Service Contract, and $20.3 million of undesignated funds that will be awarded through competitive solicitations.

FY 1997

CONTRACTOR	PRINCIPAL INVESTIGATOR	$ in 000's
ARIZONA UNIVERSITY OF	STEIN	50
BROWN UNIVERSITY	KARNIADAKIS	100
CALIFORNIA UNIVERSITY OF BERKELEY	COLELLA	150
CALIFORNIA UNIVERSITY OF BERKELEY	DEMMEL	150
CALIFORNIA UNIVERSITY OF BERKELEY	MARSDEN	100
CALIFORNIA UNIV OF SANTA CRUZ	RATIU	50
CALIFORNIA INSTITUTE OF TECHNOLOGY	KELLER/SAFFMAN	150
CARNEGIE MELLON UNIVERSITY	GREENBERG	300
CHICAGO UNIVERSITY OF	NAGEL	100
CLARK ATLANTA UNIVERSITY	MICKENS	100
COLORADO UNIVERSITY OF	MANTEUFFEL	112
COLUMBIA UNIVERSITY	GOLDFARB	100
CORNELL UNIVERSITY	COLEMAN	100
CORNELLL UNIVERSITY	GUCKENHEIMER	75
CORNELL UNIVERSITY	TREFETHEN	75
DELAWARE UNIVERSITY OF	SANTOSA	39
DUKE UNIVERSITY	GREENSIDE	52
ELIZABETH CITY STATE UNIVERSITY	ALEXANDER	25
EMORY UNIVERSITY	SUNDERAM	42
FLORIDA A&M UNIVERSITY	TURNER	240
FRONT RANGE SCI CORPORATION	MANTEUFFEL	10
HARVARD UNIVERSITY	YAU	127

CONTRACTOR	PRINCIPAL INVESTIGATOR	$ in 000's
HARVARD UNIVERSITY	JAFFEE	125
ILLINOIS UNIVERSITY OF	TIER	35
JACKSON STATE UNIVERSITY	GHOSH	360
MARYLAND UNIVERSITY OF	YORKE/GREBOGI	300
MASSACHUSSETTS INST OF TECH	SINGER	150
MATH SCIENCE RESEARCH INSTITUTE	HOFFMAN	250
MINNESOTA UNIVERSITY OF	WOODWARD	200
MINNESOTA UNIVERSITY OF	PETZOLD	78
NATIONAL ACADEMY OF SCIENCES	TUCKER	35
NEW JERSEY INST OF TECHNOLGY	KRIEGSMANN	56
NEW YORK STATE UNIVERSITY OF	GLIMM	399
NEW YORK UNIVERSITY	LAX/BERGER	1000
NEW YORK UNIVERSITY	WIDLUND	100
NORTHWESTERN UNIVERSITY	NOCEDAL	92
NORTHWESTERN UNIVERSITY	DAVIS	100
OLD DOMINION UNIVERSITY	POTHEN	50
PRINCETON UNIVERSITY	HOLMES	126
RENSSELAER POLYTECHNICAL	KOVACIC	50
RICE UNIVERSITY	TAPIA	75
RICE UNIVERSITY	DENNIS	75
SANTA FE INSTITUTE	CRUTCHFIELD/MITCHELL	68
WASHINGTON UNIVERSITY OF	LEVEQUE	100
CALIFORNIA UNIVERSITY OF BERKELEY	COLELLA	250
COLORADO STATE UNIVERSITY	OLDEHOEFT	164
ILLINOIS UNIVERSITY OF	GROSSMAN	275

CONTRACTOR	PRINCIPAL INVESTIGATOR	$ in 000's
MARYLAND UNIVERSITY OF	SAMET	135
NEW YORK STATE UNIVERSITY OF	GLIMM	100
NEW YORK UNIVERSITY	BERGER	250
PRINCETON UNIVERSITY	CELIA	50
SOUTH CAROLINA UNIVERSITY OF	SHARPLEY	100
STEVENS INST OF TECHNOLOGY	ERMLER	233
TEXAS ENG EXP STATION	EWING	200
TEXAS UNIVERSITY OF	WHEELER	200
VIRGINIA UNIVERSITY OF	PFALTZ	180
CORNELL UNIVERSITY	HEMAMI	118
FLORIDA STATE UNIVERSITY	DUKE	1534
SANTA FE INSTITUTE	STEIN	40
SANTA FE INSTITUTE	KNAPP	150
AUBURN UNIVERSITY	ROSE	266
UNIVERSITY OF CALIFORNIA	WONG	300
COLORADO STATE UNIVERSITY	TEMKIN	255
FLORIDA INTERNATIONAL UNIVERSITY	ELHAI	157
UNIVERSITY OF IOWA	DATTA	322
UNIVERSITY OF MINNESOTA	BHATTACHARYA	169
UNIVERSITY OF NEBRASKA	DOWBEN	106
TECONE	TESTARDI	170
UNIVERSITY OF TEXAS	ROBINSON	260
UNDESIGNATED a/		12245
	TOTAL CTR	$24,300

a/ Undesignated to be awarded through competitive solicitations, including funds for DOE 2000

MATHEMATICAL, INFORMATION AND COMPUTATIONAL SCIENCES

Mr. Myers How much of the requested $50.4 million in mathematical, computational and computer research is to support "DOE 2000"?

Dr. Krebs. The DOE 2000 program is supported from both the Mathematical, Computational and Computer Sciences Research and the Advanced Computation, Communications, and Associated Activities subprograms of the Office of Computational and Technology Research in addition to support from DP. Of the requested $118.3 million in these two subprograms, $10 million is planned to support DOE 2000 in FY 1997.

Mr. Myers. Provide sufficient narrative to explain DOE 2000 to include the nature of the effort, the drivers/requirements, the projected cost by fiscal year beyond FY 1997, etc.

Dr. Krebs. The DOE 2000 initiative was undertaken to improve the ability of the Department and its laboratories to fulfill their missions through R&D in and implementation of advanced computing and communications technologies. This initiative has two major subelements: National Collaboratories that will provide tools and capabilities that permit scientists, engineers and managers to collaborate on large science facilities from anywhere and to operate as a national enterprise; and Advanced Computational Testing and Simulation that will develop an advanced software environment (toolkits) for attacking large computational problems and accelerating critical applications for DOE missions.

DOE 2000 responds to Galvin Task Force recommendations that the laboratories should work more closely as a system, with the goal of achieving enhanced coordination and integration of complementary strengths. It builds on DOE DP and ER lab expertise and core competencies. The initiative began as a close DP/ER collaboration; however, it will be expanded to benefit the entire Department. In five years, DOE 2000 would complete development of advanced toolkits to accelerate computational applications such as Science Based Stockpile Stewardship and develop and demonstrate national collaboratory technology through a number of prototypes such as a National Materials Collaboratory.

The projected costs within the Office of Computational and Technology Research by fiscal year beyond FY 1997 are $10 million annually through FY 2001.

Mr. Myers. How much of the above referenced $50.4 million supports joint efforts with Defense Programs in support of the Accelerated Strategic Computing Initiatives (ASCI)?

Dr. Krebs. Joint efforts with Defense Programs in support of the Accelerated Strategic Computing Initiatives (ASCI) are supported from both the Mathematical, Computational and Computer Sciences Research and the Advanced Computation, Communications, and Associated Activities subprograms of the Office of Computational and Technology Research. Of the requested $118.3 million in these two subprograms, $12 million is planned to support collaborations with Defense Programs in support of ASCI in FY 1997. These funds include direct support of collaborations on high performance computing using clusters of shared memory multiprocessors at LANL, as well as associated work at other sites, e.g., ANL and LBNL which will be managed to enhance the fundamental software technology required to support science-based stockpile stewardship.

Mr Myers The $5 1 million increase for FY 1997 is attributable to increased support for the National Collaborators and Advanced Computational Testing/Simulation Describe any specific substantive impacts should the requested increase not be approved by the Congress.

Dr. Krebs. If the requested increase were not approved by the Congress our ability to produce the integrated tools for simulation and collaboration would be dramatically reduced As a consequence, the Department would not achieve its goals to reduce costs and improve results by better integrating our laboratories through effective collaboration, augmenting or substituting for experiments by cost-effective computing, and making our user facilities better accessible to outside users.

Without this support for these two elements of DOE 2000, the Department would lack the capability to put into practice an effective numerical simulation effort within the Science Based Stockpile Stewardship program or provide more cost-effective use of its major research facilities. such as the Advanced Light Source, the Advanced Photon Source and, eventually, the Department's neutron sources This allows the remote use by the Department's researchers of these activities.

LABORATORY TECHNOLOGY RESEARCH

Mr Myers Provide additional supporting detail providing justification of the requested (1) $3 0 million for computational technology projects, (2) $3 2 million for support for ongoing multi-year laboratory collaborative projects and (3) $2 4 million for technical assistance activities

Dr Krebs The Laboratory Technology Research Program manages generic, pre-competitive technology research collaborations that serve the Department's public missions of energy, research and the environment, expand the skills and capabilities of laboratory staff, and are of long-term, strategic importance to America's science and technology superiority All of the funds requested support high risk, long term technology research aimed at bringing basic research results to the point where industry and Department of Energy technology programs can exploit the innovations The program links the basic science at ER national laboratories to applied technologies through leveraged collaborations with universities and industries Research conducted by the program has received substantial scientific recognition; since 1993 the program has received four R&D 100 awards and eight Federal Laboratory Consortium awards, the Coblentz award in spectroscopy, and the Photonics Spectra Circle of Excellence award recognizing technically innovative optical products

The $3.0 million for computational technology projects will take advantage of the unique talents and capabilities residing within the Department's laboratory complex to work on generic computing problems, relevant to oil and gas exploration and recovery, under the sustainable environments technology focus area Computational technology projects have been supported by the Office of Defense Programs, the Office of Energy Research, and the Office of Fossil Energy Energy Research projects will be subject to competitive merit evaluation based on peer review.

The $3.2 million for support of multi-year laboratory collaborative projects will maintain ongoing technology research collaborations in intelligent manufacturing, tailored materials, and sustainable environments focus areas, leveraging national laboratory expertise with industrial resources for mutual benefit. This research is high-risk, long-term fundamental research, which promises substantial changes in processes or products in technology areas that have strategic importance to DOE missions as well as to American industry. This type of research also carries promise for high potential impacts on society

The $2.4 million for technical assistance activities supports technology deployment to the nation's entrepreneurial small business sector, providing quick and easy access to the unique science base and technical resources at the National Laboratories to solve complex problems. Follow-on technology development by these companies is leading to scores of examples of significantly improved economic competitiveness for the country.

HIGH ENERGY PHYSICS

Mr Myers Describe the nature of the increase of $3.4 million in the Facilities Operations allocation to SBIR.

Dr. Krebs. The increase of $3,356,000 in the SBIR allocation in the Facilities Operations subprogram reflects the $2,655,000 increase in the total SBIR allocation due to the legislatively-mandated increase in the required contribution, together with a reallocation in the amount of $701,000 from the High Energy Technology subprogram.

Mr. Myers. How much of the total Facility Operations request amount ($271.2 million) is "allocated" to SBIR.

Dr. Krebs. The FY 1997 SBIR total allocation of $12,185,000 includes $7,954,000 in Facility Operations and $4,231,000 in High Energy Technology.

Mr. Myers. What funding is provided for the Large Hadron Collider project in fiscal years 1995, 1996 and 1997?

Dr. Krebs. The funding requested for U.S. participation in the LHC project at CERN is $15 million in FY 1997 distributed between High Energy Technology and Related Capital Funding. The FY 1996 funding was $6 million, no significant FY 1995 funding was provided

Mr. Myers. Please explain the increase of $7.2 million in research and development for the project.

Dr. Krebs. It is anticipated that an agreement with CERN for U.S. participation in the LHC project will be concluded during calendar year 1996. This agreement will identify specific components and subsystems for which the U.S. will be responsible. The funding requested in FY 1997 is at an increased level necessary to support R&D in these selected areas in preparation for the initiation of major fabrication efforts in FY 1998 Probable areas of U.S involvement include such things as special superconducting magnets, hadron calorimeters, muon detectors, and large scale silicon detectors.

Mr. Myers. The Related Capital Funding category includes an increase of $5.7 million in capital equipment needs relating to several projects. Please describe the impact(s) to the projects should this increase not be provided.

Dr. Krebs. The Related Capital Funding request includes an increase in the amount of $1,800,000 for the activities related to the planned U.S. involvement in the LHC project at CERN. It is expected that agreement will be reached by the end of FY 1996 specifying the particulars of the U.S. involvement in the LHC. The FY 1997 request includes funding for a major R&D program needed to be ready for the fabrication of subsystems and components for the LHC beginning in FY 1998. The Related Capital Funding is needed for the provision of specialized test equipment and the fabrication of prototypes. A substantial reduction in the

requested funding would delay the start of fabrication for those items which the U.S. will have agreed to provide and could possibly impact the final completion of the LHC and further damage the U.S. reputation as a reliable international partner.

The Related Capital Funding request includes an increase of $6,500,000 for additional funding of the detector for the B-factory being built at SLAC. It is exceedingly important for this major (and only) detector for the B-factory to be ready in FY 1999 when the B-factory begins operation. Because of the amount of work remaining on the detector and the long lead time involved in some of the subsystems and components, any significant reduction in the requested funding would result in the detector not being ready when the B-factory is fully operational

The request also includes an increase of $4,750,000 for upgrading the two Tevatron collider detectors at Fermilab. These upgrades are required to allow the detectors to operate with the much higher beam intensity which will be available when the Fermilab Main Injector is completed in FY 1999. Because of the amount of work remaining on the detector and the long lead time involved in some of the components and subsystems, any significant reduction in the requested funding would result in these two detectors not being available when the Main Injector is ready to begin operation.

These increases are offset by reductions of $2,500,000 for the g-2 experiment $1,525,000 for the KTeV experiment, $1,700,000 for the Next Linear Collider Test Facility, and $1,625,000 for the Anti Matter in Space experiment as fabrication of these items are completed

Mr. Myers. Please provide the following information for Project 94-G-304, B-Factory, and Project 92-G-302, the Fermilab Main Injector. Uncosted and/or unobligated balances at September 30, 1995 and the projected uncosted and/or unobligated balances at September 30, 1996 for this line item project.

Dr. Krebs. For the Fermilab Main Injector, as of September 30, 1995, the unobligated balance was zero and we project that, as of September 30, 1996, the unobligated balance will be zero.

For the B-factory at SLAC, as of September 30, 1995, the unobligated balance was zero and we project that, as of September 30, 1996, the unobligated balance will be zero.

The obligations are consistent with the projects funding needs required to maintain cost and schedule. The costs schedule indicated in data sheet are commensurate with the delivery and installation of hardware.

Mr. Myers. Detail relative to how the FY 1997 requested obligational authority will be used (i.e., for fixed price contracts, in-hours M&O labor, etc.)

Dr. Krebs. Of the total of $52 million for the Fermilab Main Injector in FY 1997, approximately $42 6 million will be used for outside fixed price contracts and $9.4 million will be for inhouse M&O labor.

Of the $45 million for the B-factory in FY 1997, approximately $29 3 million will be for outside fixed price contracts and approximately $11 8 million will be used for inhouse M&O labor.

Mr. Myers. Could the FY 1997 request be practically reduced with some of the remaining budget authority provided in a subsequent fiscal year? Give advantages and disadvantages along with the detail.

Dr. Krebs. For the Fermilab Main Injector, reduction of the $52 million requested for FY 1997 would result in delaying some of the planned acquisitions leading to a delay in the project completion and an increase in the project cost Since the construction schedule and the laboratory's operating schedule have been carefully coordinated with regard to the extended shutdown needed for connection of the Main Injector to the Tevatron, any slippage in the construction schedule would impact the full laboratory program. Thus we see no programmatic advantage to delaying any significant amount of Budget Authority.

For the B-factory at SLAC, reduction of the $45 million requested for FY 1997 would require delaying some of the planned outside procurements. Since FY 1997 is planned to be the last year of construction funding, such delays would lead to a significant disruption of the schedule to complete the machine and bring it into operation in FY 1998. Thus we see no programmatic advantage to delaying any significant amount of Budget Authority.

NUCLEAR PHYSICS

Mr. Myers. Why does the allocation to SBIR increase by a factor of two?

Dr. Krebs. The allocation to SBIR from the Nuclear Physics Program for fiscal year 1997 is 2.5% of the operating funding (in fiscal year 1996 the allocation was 2%) for a total increase of $1.3 million. This increase was allocated to, and allowance was made for, within the "Medium Energy Subprogram", leading to an increase of a factor of two only within that subprogram.

Mr. Myers. Please describe the impact of not funding the requested $3.6 million increase in facility operations. Be specific.

Dr. Krebs. An increase of $3.6 million in facility operations is requested within the "Medium Energy Subprogram". If this increase is not provided, the Continuous Election Beam Accelerator Facility (CEBAF) will operate only 3000 hours for research in fiscal year 1997, instead of the planned 4500 hours.

RELATIVISTIC HEAVY ION COLLIDER

Mr. Myers. The data sheet for the Relativistic Heavy Ion Collider notes that the $5 million funding reduction in fiscal year 1996 was partially offset by an additional $2.5 million in operating and $1 million in capital equipment funding, yet the total estimated cost has increased by $11.6 million. Please explain how a funding reduction of $1.5 million in fiscal year 1996 could possibly result in an $11.6 million increase in the total estimated cost of a project which will not be completed until fiscal year 1999.

Dr. Krebs. Inherent in the previous project baseline of RHIC was a significant amount of schedule risk. This risk was due to a reduced annual funding profile introduced in fiscal 1994 by the Nuclear Physics Program because of reduced overall funding and major industrial contracts for superconducting magnets in place which had been negotiated under the assumption of the original funding profile. The resulting cash flow problem was addressed by rescheduling the allocation of project contingency until late into the project. The baseline based on this strategy, however, did not provide flexibility for further annual reductions without significant increases in costs and schedule. The loss in buying power, resulting from the $5 million reduction in construction funding in fiscal 1996, is not restored until fiscal 1999 when the project is scheduled to be completed. Although mitigated by the addition in fiscal 1996 of $3.5 million in operating and capital equipment funds from within Nuclear Physics Program total funding, a three-month delay was caused by this reduction. The RHIC core technical team which is now engaged in completing the construction project and commissioning the facility must be maintained until operation. Of the $11.6 million increase in total estimated cost, $7.4 million arises from the need to support RHIC Project personnel for three extra months. The remaining $4.2 million arise from labor cost increases due to stretching out production and assembly schedules, modest materials increases related to less efficient procurement, and the escalation on budget authority deferred to FY 1999.

Mr. Myers. Provide specific detail on each item of the (RHIC) project whose cost increased. Show how each increase was calculated.

Dr. Krebs. After the FY 1996 Congressional Budget was submitted the project costs were reviewed and the cost estimate was rebaselined. While the project total was not changed portions of the contingency were allocated to specific project cost elements and adjustments were made between various project cost elements. Subsequently, the FY 1996 funding for the project was reduced by $5.0 million in construction. The table below delineates the changes between this rebaselined estimate and the revised estimate based on FY 1996 reduced funding. These cost increases result from the deferral of purchasing power for construction activities from FY 1996 to FY 1999 and three-month delay in project schedule.

	B/A (in thousands of dollars)		
Construction Costs	FY 1996 Rebaseline	FY 1997 Data Sheet	Changes
Engineering, Design, Inspection & Administration	82,333	83,982	1,649
Conventional Const	9,730	9,640	(90)
Collider Installation	31,130	31,120	(10)
Magnet System	137,920	141,240	3,320
Collider Systems	95,670	97,920	2,250
Collider Contingency	6,467	7,968	1,501
	363,250	371,870	8,620
Detectors	112,000	115,000	3,000
	475,250	486,870	11,620

The calculations for the increases are based on supporting core personnel with project funds over the three month delay ($7.4 million), allocation of contingency to cover risk associated with the delay ($2.0 million), material costs related to less efficient procurement ($1.4 million), the escalation on budget authority deferred to FY 1999 ($0.6 million) and increased electrical power and other direct costs over three months ($0.2 million).

Mr. Myers. Indicate which specific construction items in fiscal year 1996 were reduced from the original estimate and by how much. Show the revised cost for each of the items where funding was reduced.

Dr. Krebs. The following table provides a comparison of the original estimates as planned for in the FY 1996 Congressional Data Sheet versus the current plan:

	FY 1996 B/A (in thousands of dollars)		
	Original		Current
Construction Costs	Plan	Plan	Reduction
Engineering, Design, Inspection & Administration	11,377	11,377	0
Conventional Const	600	600	0
Collider Installation	5,480	5,480	0
Magnet System	21,207	18,127	(3,080)
Collider Systems	12,356	11,436	(920)
Collider Contingency	0	0	0
	51,020	47,020	(4,000)
Detectors	18,980	17,980	(1,000)
	70,000	65,000	(5,000)

Mr Myers Was there no possible way to achieve any efficiencies such that this minor reduction (in the RHIC project) could be absorbed in the overall cost of the project? Identify all possible management options that were explored to maintain the current total estimated cost before the decision was made to increase the cost of this project to the taxpayer.

Dr. Krebs. The loss in construction funding in fiscal year 1996 came at a time when the project had established industrial contracts and employed the staff needed to sustain the project into successful operation. The current staffing levels are considered to be the minimum to complete the project. DOE and RHIC Project Management have worked together to minimize the impact of the fiscal year 1996 reduction by reallocating an additional $3.5 million in operating and capital equipment funds from within Nuclear Physics program total funding to limit the schedule slippage to three months. A number of options for addressing the reduction in fiscal 1996 funding were explored by RHIC Management. At this stage of the project, with conventional construction completed, most industrially produced magnets installed and technical staff being trained for commissioning, it is too late to descope the Collider in any meaningful way. Options of renegotiating industrial contracts and reducing staff significantly below current levels were rejected because the actual cost growths and schedule slippages associated with these options exceeded that of the strategy chosen in the Rebaselined Project. Consideration was given to possible descoping of the initial experimental program. This option was rejected because essentially all funding in FY 1996 was for the two major detectors which are in advanced stages of construction by scientific collaborations that involve more than 700 scientists and students from 81 U.S. and foreign institutions. The absence of either of these two detectors would seriously compromise RHIC's physics capabilities and the additional costs to the Program, outside of the

compromise RHIC's physics capabilities and the additional costs to the Program, outside of the Project, for delay are significant It should be noted that RHIC operations requirements in fiscal year 1999, with the slippage in completion, will be reduced from 6 to 3 months, with a commensurate reduction in machine running costs, thereby offsetting most of the increase in Total Project Costs

RELAVISTIC HEAVY ION COLLIDER

Mr Myers The data sheet on RHIC indicates that, in fact, the major increases in fiscal year 1997 have occurred in the collider installation and magnet system costs Please provide specific details explaining why these costs have increased by $5.2 million and $16 2 million, respectively, in fiscal year 1997

Dr Krebs The increases for collider installation and magnet system costs of $5 2 million and $16 2 million, respectively, are the increases in the total cost for these systems as reflected in the 1997 Data Sheet compared with the 1996 Data Sheet These increases include two components, (1) cost growths and adjustment between various project cost elements addressed by distribution of contingency within the Project prior to fiscal 1996 Congressional action and (2) increases for these systems as a result of the three-month schedule delay that has been discussed in response to a previous question The collider installation, which is now 45% complete, increased by $5 2 million (allocated from contingency) due almost exclusively to the additional scope of fabricating the interconnecting cryostats ($5.0 million). There was no additional increase to collider installation due to the fiscal 1996 funding reduction. The total cost of the magnet system, now 86% complete, increased by $12.9 million (allocated from contingency) to address actual costs of superconducting magnet contracts with industry, including over $12 million in cost growth for the Northrop Grumman Phase I (Technology Transfer) contract An additional $3 3 million is attributed to the fiscal year 1996 funding reduction.

GENERAL SCIENCES PROGRAM DIRECTION

Mr Myers Provide detail to describe the cost elements comprising the Chicago and Headquarters "support services" category If a portion of the requested amounts is for support service contracts, provide that detail by contract, deliverables to the DOE, task description(s), average man-years of effort and associated estimated cost.

Dr. Krebs. Energy Research has been the most conservative of all of the major DOE program offices in the use of support service contractors. The support services contracts funded in General Sciences Program Direction for Headquarters are primarily for three types of services The first is information resources management support currently provided by Dyncorp; it includes six staff years and covers the complete realm of computer support, including planning, systems development, local area and wide area networking and servicing of desk-top workstations Deliverables include, for example, operation of the ER local area network, computer service upgrades and the development of ER-wide program management systems. The second is support provided by Dimensions, Inc., which includes two staff years for operation of the mailroom, travel processing and ad hoc word processing The third is specialized technical support. It includes three staff years of support by Weston, Inc , for assisting in carrying out ER's line environment, safety and health responsibilities and one staff year by META, Inc., for helping with our safeguards and security responsibilities. Deliverables consist primarily of reviews and analyses of complex scientific and technical issues META also provides a small amount of support in the area of training and development. In total, the FY 1997 request for Headquarters support services contracts in General Sciences Program Direction is $420,000.

The Chicago support services request of $135,000 includes miscellaneous support such as training, transportation of goods, printing and office automation services.

Mr. Myers. For the Headquarters organization, justify the $+6,800 average travel per FTE. On the presumption that a portion of the Headquarters staff will have limited-to-zero travel, the per FTE average cost appears high

Dr. Krebs. Energy Research programs and facilities are scattered throughout the U.S., while program management responsibility for General Science Programs resides in headquarters. It is essential for ER's program managers to be able to visit the sites where the programs are being conducted and to attend major conferences and meetings involving their fields of science. It enables them to conduct program and construction project reviews, meet with their colleagues, share ideas, and remain cognizant of state-of-the-art scientific developments, which is essential if we are to maintain the scientific and technical excellence in our programs. In addition, many of the latest new scientific facilities are being built in other countries. While international travel is expensive, visiting these facilities and conducting collaborative programs with them allow us to leverage U.S. research dollars and help keep U.S. scientists at the forefront of scientific and technology developments. An excellent example involves the ongoing negotiations with CERN regarding the Large Hadron Collider. Because of termination of the Superconducting Super Collider, the Large Hadron Collider project is critical to the future of the U.S. high energy physics program.

Mr. Myers. For Oak Ridge and Headquarters, describe the elements of cost included in the "Other Related Expenses" category

Dr. Krebs. Other Related Expenses for Headquarters and Oak Ridge include acquisition of computer hardware and software for office automation. They also include training and development costs for staff funded in General Sciences Program Direction.

Mr. Myers. Please explain how the program direction account had available unobligated balances of $6,450,000 in fiscal year 1996.

Dr. Krebs. The balance you have cited is a combined figure which includes the program direction balances for Energy Research in both the Energy Supply Research and Development and the General Sciences and Research appropriations. The balance is the result of the effects of the Department's moratorium on hiring, which lasted for most of FY 1995 and prevented the filling of vacancies, and delays in contract actions.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. Describe the Department's current relationship with the United States Enrichment Corporation (USEC). Identify all activities funded in fiscal years 1995, 1996, and 1997 by the Department in support of this program

Dr. Lash. The Department of Energy (DOE) supports the United States Enrichment Corporation (USEC) in five broad categories: (1) activities that are reimbursed by USEC, (2) preexisting liabilities that were identified in the Energy Policy Act of 1992; (3) one time funding transfers to USEC related to the December 1994 Memorandum of Agreement, (4) costs associated with initial Nuclear Regulatory Commission (NRC) certification, and (5) conduct of the Russian transparency program that has the objective of increasing confidence that low enriched uranium purchased by USEC from Russia has been derived from Russian highly enriched uranium.

The Department administers the lease for the diffusion plants that includes oversight of property leased by USEC, purchase of electrical power to operate the gaseous diffusion plants, and regulatory oversight until NRC certifies the gaseous diffusion plants. These activities are reimbursed by USEC.

Preexisting liabilities are collection, containment and eventual treatment of polychlorinated biphenyl contaminated waste resulting from the continued operation of the leased diffusion plants and a prorata share of the costs of life and medical benefits for retired diffusion plant and electrical power supplier workers.

A one-time transfer of $40,370,000 will be made to USEC to fulfill DOE responsibilities to pay for Occupational Safety and Health Act deficiencies and other activities at the gaseous diffusion plants in accordance with the December 15, 1994, Memorandum of Agreement relating to the transfer of functions and activities.

Initial certification of the leased diffusion plants is the largest DOE activity in support of USEC. Certification activities are funded by the normal appropriation process and from the proceeds of downblended highly enriched uranium and the sale of excess uranium inventories. Activities funded by the normal appropriation process are preparation of the DOE Compliance Plan, provision of safety analysis support to USEC, consistent with the December 1994 Memorandum of Agreement, and support to NRC in their preparation of an annual report to Congress on the health and safety status of the gaseous diffusion plants. USEC costs for preparing the initial certification application and the costs associated with modifications identified in the Compliance Plan are funded through the sale of excess material.

USEC has a contract with the Russian Government to purchase low enriched uranium (LEU) that was blended down from weapons material. The Department's transparency program provides assurances that LEU purchased by USEC is derived from weapons material.

The actual costs for FY 1995 and projected costs for FY 1996 and FY 1997 are presented in the table below.

COST IN MILLIONS OF DOLLARS			
SUPPORT AREA	ACTUAL COST	PROJECTED COST	
	FY 1995	FY 1996	FY 1997
REIMBURSED BY USEC	15.2	12.3-12.5	5.5-10.5
Lease Administration	0.5	0.5	0.5
Regulatory Oversight	9.5	10.5	5.0-10.0
Safety Analysis	5.2	1.3-1.5	0
PAID BY DOE THROUGH APPROPRIATIONS	25.9	72.2	30.5
Post Retirement Life and Medical Benefits	10.5	11.6	12.9
PCB Collection and Containment	3.9	4.9	4.9
One Time Transfer to USEC	0	40.4	0
Safety Analysis*	1.5	0	0
DOE Compliance Plan and Verification of Billings	5.7	4.0	0.8
Supporting NRC Annual Report to Congress	0	0.1	0.5
Transparency	4.3	11.2	11.4
PAID BY THE SALE OF EXCESS MATERIAL IN INVENTORY	17.4	39.0	37.0
USEC NRC Certification	17.4**	39.0	37.0

*Includes only those activities that directly support USEC.
**Actual validated costs; no costs have been offset against HEU.

DEPARTMENT'S ROLE IN THE PURCHASE OF RUSSIAN HIGHLY ENRICHED URANIUM

Mr. Myers. Please describe the Department's role in the purchase of highly enriched uranium from Russia, including funding transactions with and through USEC.

Dr. Lash. The U.S. Enrichment Corporation (USEC) is the Executive Agent for the U.S. government on activities related to the purchase of LEU derived from Russian HEU resulting from the February 1993 bilateral agreement with the Russian Federation for the disposal of highly enriched uranium contained in excess Russian nuclear weapons. The Department is responsible for formulation of policy and the implementation of transparency activities in Russia to ensure that Russian weapons grade highly enriched uranium (HEU) is being converted into low enriched uranium (LEU) in facilities in Russia. USEC is the government's agent for purchasing and sale of the LEU derived from the conversion of Russian HEU.

The Department has designated natural uranium from the Department's surplus inventories to be used as collateral to USEC for advance payments to Russia on two separate transactions. First, the Department set aside 2,000 metric tons of natural uranium as collateral for an initial $60 million advance payment to Russia in FY 1994. Another 3,333 metric tons of natural uranium was set aside in FY 1995 for use as collateral on a $100 million advance payment to Russia. Deliveries of LEU from Russia through FY 1997 will be used in part to credit the advanced payments, thereby, releasing the collateralized material.

USE OF APPROPRIATED FUNDS FOR TRANSPARENCY MEASURES AT USEC

Mr. Myers. Are appropriated funds being used for these activities?

Dr. Lash. No appropriated funds were used for providing the Department's natural uranium inventories as collateral for USEC's $160 million dollars in advance payments under the USEC HEU purchase contract.

Funds have been appropriated for the Department's transparency activities. In Fiscal Year 1997 $13.9 million is requested through the Department's Uranium Program account and an additional $1.1 million is included in the Department's Uranium Program Direction Account (for a total of $15.0 million) to pay for the cost of monitoring activities at three Russian conversion facilities, to support Russian monitoring activities at six facilities in the United States, and to provide support for oversight activities.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. Has there been any indication that USEC may return one of the existing gaseous diffusion plants to the Department of Energy? What would be the impact of this?

Dr. Lash. The USEC has informally indicated that the earliest date to return a plant would be after the year 2002. The timing must be considered uncertain because it is dependent on factors such as the construction and operation of an AVLIS plant and the market for enrichment services.

The Department initiated the development of a contingency plan in FY 1995 to determine required actions in the event of a plant turn back; the plan will be available in June 1996. The lease states that USEC may return a plant with two years' notice to the Department. This transition is required to shutdown the plant and make required facility adjustments for the returned plant. Funding for these activities is to be provided by the Department. The cost for this transition period is still being evaluated.

During the transition period, the major impact to the Department would be to assure that utilities such as heat, water supply, and electrical distribution are maintained in a cost-effective manner. The diffusion plants use waste heat from the gaseous diffusion process to heat most of the buildings. After plant shutdown, additional heating capacity must be added. The water distribution system was designed to provide for very high flow rates. With water needs reduced by an order of magnitude, smaller distribution pumps would be installed to accommodate the new flow rates. Similar changes must also be made to the electrical distribution system.

Upon completion of the transition period, the Department would be responsible for surveillance and maintenance of the plant, as well as all decontamination and decommissioning activities.

GASEOUS DIFFUSION PLANTS

Mr. Myers. Do you have an estimate of the cost of decontaminating and decommissioning the gaseous diffusion plants?

Admiral Guimond. Yes. The Office of Environmental Management recently completed an extensive refined decontamination and decommissioning (D&D) cost estimate of the three gseous diffusion plants. The two plants currently leased by USEC (Portsmouth and Paducah) are estimated to cost $2.8 billion and $3.2 billion respectively. The D&D cost of the inoperable gaseous diffusion plant in Oak Ridge (K-25) is estimated to cost $3.2 billion. Total cost estimate: $9.2 billion.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. What is the status of the AVLIS technology transfer from LLNL to USEC?

Dr. Lash. USEC has been funding all AVLIS deployment and demonstration activities since October 1993. On April 28, 1995, the Department and USEC signed an agreement transferring the AVLIS technology to the USEC. The Department is no longer involved in AVLIS development. The Department allows LLNL to work on AVLIS for USEC through a work for others arrangement.

URANIUM ENRICHMENT PROGRAM PRIOR YEAR FUNDING

Mr. Myers. Explain the FY 1997 prior year balance offset portion which relates to an FY 1993 reprogramming which the Department is applying to post-FY 1993 fiscal years.

Dr. Lash. The prior year balance offset portion of the Uranium Programs budget that relates to the FY 1993 reprogramming is $14,916,000. In September 1993, the Department submitted a reprogramming proposal to the Congress to reprogram $197,979,000 within the Uranium Supply and Enrichment Activities appropriation to manage responsibilities left with the Department after the formation of the United States Enrichment Corporation. In October 1993, the House Energy and Water Appropriations subcommittee expressed support for this reprogramming. No other Committees have replied to the proposal.

Of the original $197,979,000 proposed for reprogramming, $117,693,000 has been transferred or obligated for critical activities, including a transfer to the United States Enrichment Corporation under the Determination Order which provided for transfer of certain assets to the new corporation. Of the remaining $80,286,000, $40,370,000 will be transferred to the United States Enrichment Corporation to fulfill Department of Energy responsibilities to pay for nuclear safety oversight and compliance activities and the correction of Occupational Safety and Health Act deficiencies at the gaseous diffusion plants leased by the United States Enrichment Corporation. The other $39,916,000 has been applied to offset the FY 1996 ($25,000,000) and FY 1997 ($14,916,000) budget requests.

TOTAL URANIUM ENRICHMENT PROGRAM BUDGET

Mr. Myers. Explain the difference between the FY 1997 budget request amount of $87,266,000 and the $81,594,000 amount used in several places in the FY 1997 budget materials.

Dr. Lash. The difference between the FY 1997 budget request amount of $87,266,000 and the $81,594,000 is $5,672,000, which represents the amount requested for Program Direction under the Uranium Programs budget request. Program Direction is broken out separately based on guidance in last years's Energy and Water Development Appropriations Act.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. Provide detail regarding the FY 1996 to FY 1997 increase of $3,200,000 in the pre-existing liabilities.

Dr. Lash. The increase is due to the projected additional Lockheed Martin Utility Services personnel on the retirement roles in late FY 1996 and FY 1997 and the expected annual increase in the cost of health care. For Lockheed Martin Utility Services retired personnel, DOE pays a prorata share based on the number of years under DOE service, and USEC pays a prorata share based on the number of years under USEC.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. Provide any actuarial detail which would portray or characterize what the funded liability is projected to be for fiscal years subsequent to FY 1997.

Dr. Lash. The Department conducts a study on life and health for retired personnel and pensions. The most current study was completed in June 1995 and that review indicated the future liability beyond FY 1997 for Lockheed Martin, the M&O contractor for the diffusion plants was $67.0 million and $16.8 million for Ohio Valley Electric Corporation, the utility that provides power to the Portsmouth Enrichment Plant for a total of $83.8 million. These future costs include the cost associated with personnel that retired prior to July 1, 1993, for which DOE is totally responsible for, and a prorata share for those employees that retired after July 1, 1993.

TRANSPARENCY MEASURES INCREASE IN FUNDING NEEDS

Mr. Myers. The Transparency Measures category reflects a factor-of-two increase in the request for FY 1997. The narrative materials cites one additional Russian facility as the reason which, on the surface, seems extraordinary. Provide some detail regarding the specifics of such an increase.

Dr. Lash. FY 1997 will be the first year that all of the necessary monitoring agreements and monitoring activities will be performed at the Russian facilities on a routine basis. During FY 1997 up to six special monitoring visits will be made to each of three Russian facilities for a total of up to 18 trips and permanent presence monitoring offices will be in place at two of the facilities. During FY 1996 only 5 monitoring trips, 1 familiarization visit, and 1 special visit will be made to Russian facilities and only 1 permanent presence office will be opened during the summer of 1996. Each permanent office will have a staff of four that will be rotated out every 60 days. In addition to the monitoring activities in Russia, FY 1997 will be the first year when Russia will perform routine monitoring in six U.S. facilities that will be receiving and processing LEU derived from Russian HEU. The FY 1997 budget request includes funding for U.S. representatives assisting the Russian monitoring teams at the United States facilities, i.e., U.S. DOE representatives at the U.S. fuel fabricator monitoring sites, escorts, interpreters for U.S. representatives and miscellaneous expenses incurred by DOE. The Russian monitoring team is responsible for its own lodging, food, transportation and any additional requested services as agreed to in the Annexes.

TRANSPARENCY PROGRAM COORDINATION WITH PARTS OF THE BUDGET

Mr. Myers. How does the Transparency Measures program described as part of Uranium Enrichment coordinate with the Verification and Control Technologies Programs included in the Other Defense Activities portion of the FY 1997 budget?

Dr. Lash. The Department has separated the policy and implementation activities associated with the Transparency program. The Office of Arms Control and Nonproliferation is responsible for all policy development and negotiation of agreements. The Office of Nuclear Energy, Science and Technology is responsible for all transparency implementation and funds those activities through the Uranium Programs budget. Both offices work closely to ensure that the transparency implementation activities reflects the policy objectives and adheres to agreements under development, being negotiated, or signed.

URANIUM ENRICHMENT PROGRAM

Mr. Myers. FY 1996 reflected a tremendous increase in the maintenance program for depleted uranium hexafluoride cylinders. The FY 1997 request is not substantially different from the FY 1996 funding level. Please describe the plan for this program in terms of accelerated actions and the planned timeline for these accelerated actions, when "surge" activities will terminate in favor of a levelized maintenance program, and the projected cost by fiscal year for a levelized program.

Dr. Lash. The Department of Energy is responsible for managing approximately 47,000 four by twelve foot cylinders, containing about 560,000 metric tons of depleted uranium hexafluoride, located at the Paducah, Portsmouth, and Oak Ridge sites. This material resulted from the Department's operation of the enrichment plants over the past 40 years.

Cylinder maintenance program priorities include: (1) relocating all cylinders from ground contact and keeping them from further ground contact; (2) relocating all cylinders into adequate inspection configuration and keeping them that way; (3) repainting cylinders as needed to avoid excessive corrosion; (4) improving cylinder storage yards, including converting gravel yards to concrete yards to reduce the cylinders' exposure to moisture and building new cylinder yards to provide adequate spacing, and (5) regularly inspecting the cylinders and performing necessary maintenance to ensure cylinder integrity. These priorities are responsive to the findings of Defense Nuclear Facilities Safety Board Recommendation 95-1, *Improved Safety of Cylinders Containing Depleted Uranium.*

In order to maintain the Depleted UF_6 Management Baseline Schedule, which I will provide for the record, and the Department's Recommendation 95-1 Implementation Plan, cylinder maintenance activities will increase through FY 2001. In addition to the activities summarized in the table, cylinder maintenance activities include ultrasonic testing of selected cylinders to determine their wall thickness, replacement of wood supports with concrete chocks for all cylinders in order to increase stability and reduce exposure to moisture, inspection of valves and replacement of those suspected of leaking, and repair, inspection, monitoring and investigation of seven cylinders that have experienced breaches as a result of mishandling incidents or accelerated corrosion.

Also underway is a long-term planning activity, consisting of depleted uranium hexafluoride cylinder strategy selection and implementation. In FY 1996, the Department initiated preparation of an environmental impact statement (EIS) which will identify management and disposition options. The Draft EIS will be completed in FY 1997, at which time public comment hearings will be conducted. Also underway is preparation of a Cost Analysis Report, which will evaluate life cycle costs for the strategy alternatives addressed in the EIS. The Record of Decision selecting the long-term disposition strategy is planned to be issued in FY 1998. Implementation of the selected strategy will be preceded by an assessment of the environmental impacts of site- and technology- specific use and management options for the selected strategy. The schedule of program activities are also shown in the Depleted UF_6 Management Baseline

Schedule.

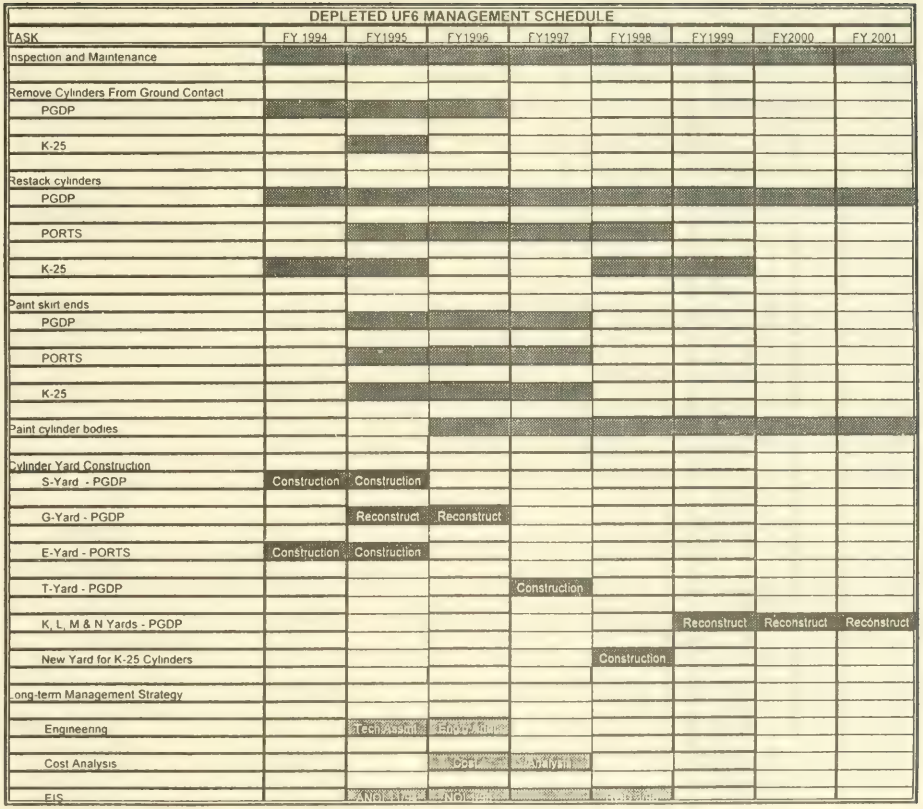
The funding profile for the program through FY 2001 is shown in a table which I will provide for the record. The information follows:

(dollars in thousands)

	1995	1996	1997	1998	1999	2000	2001
Operating and Equipment	8,657	23,565	22,883	26,879	29,568	30,833	33,157
Construction Projects	8,152	6,400	4,000	6,000	8,000	2,700	0

These outyear budget estimates are exclusive of any program requirements arising from the selection of the long-term management strategy to be announced in the planned FY 1998 Record of Decision. Any conversion of the material from the UF_6 form to an oxide, for example, would require additional funding.

Core activities include monitoring the status of the cylinders by maintaining records on their condition and locations, inspection, maintenance, conducting ultrasonic testing and other technical analyses on the cylinders' structural condition and integrity, and maintaining the technical and management personnel to oversee the program. These core activities will continue indefinitely as long as the UF_6 is stored in its present form. Cylinder yard construction activities and restacking of cylinders will be completed in October 2001. At that time, "surge" activities, those one time activities such as building new cylinder yards and restacking cylinders, will have been completed with the possible exception of whole body cylinder painting. The time required to paint all cylinders (i.e., over a period of 5, 7, or 10 years) will be resolved when the Department completes a technical analysis of corrosion issues and evaluates results from a pilot project on cylinder painting at Paducah. The Department is committed to provide a schedule to the DNFSB in July 1996.


DEPLETED UF6 MANAGEMENT SCHEDULE
TASK
FY 1994
FY1995
FY1996
FY1997
FY1998
FY1999
FY2000
FY 2001
Inspection and Maintenance
Remove Cylinders From Ground Contact
PGDP
K-25
Restack cylinders
PGDP
PORTS
K-25
Paint skirt ends
PGDP
PORTS
K-25
Paint cylinder bodies
Cylinder Yard Construction
S-Yard - PGDP
Construction
Construction
G-Yard - PGDP
Reconstruct
Reconstruct
E-Yard - PORTS
Construction
Construction
T-Yard - PGDP
Construction
K, L, M & N Yards - PGDP
Reconstruct
Reconstruct
Reconstruct
New Yard for K-25 Cylinders
Construction
Long-term Management Strategy
Engineering
Cost Analysis
EIS

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URANIUM ENRICHMENT PROGRAM DIRECTION

Mr. Myers. The program direction account narrative indicates that resources are required for "...some employees of non-Department of Energy federal organizations...". Assuming this is a true representation, what statutory authority permits resources appropriated to a DOE account to pay the salaries/fringe benefits, etc., of employees of other Federal entities?

Dr. Lash. The narrative pertains to travel expenses of Department of State employees who are involved in Transparency Measures activities and for interpreter services and transportation while attending meetings related to transparency activities in Russia and other countries. Department of Energy funding is not used to fund salaries, fringe benefits, etc. of employees of the Department of State or any other non-Department of Energy federal organization.

URANIUM ENRICHMENT PROGRAM TRAVEL COSTS

Mr. Myers. Explain why the per FTE cost of travel from FY 1996 to FY 1997 would increase from nominally $20,000 per FTE to $30,000 per FTE. Be specific.

Dr. Lash. The increased travel cost is due to increased travel related to Transparency Measures. All Transparency Measures travel involving Federal employees is budgeted in the Headquarters account pending final selection of individuals for monitoring trips to Russian uranium processing facilities. In FY 1997, travel will be required to monitor activities at three Russian facilities as opposed to only two in FY 1996. In addition, FY 1997 will be the first year that all of the necessary monitoring agreements will be in place and monitoring activities will be performed on a routine basis. During FY 1996, Federal personnel will be included on 5 special monitoring visits and 1 familiarization visit to Russian facilities subject to monitoring activities. Federal personnel will also be participating in the permanent presence office to be opened at one of the Russian facilities prior to the end of FY 1996. During FY 1997, Federal employees will participate in up to 18 monitoring trips as well as several tours of duties as members of the permanent presence office staffs at possibly two Russian facilities.

URANIUM ENRICHMENT PROGRAM UNOBLIGATED BALANCES

Mr. Myers. Given that this program has substantial unobligated balances at the end of both FY 1995 and (projected) FY 1996, why should the Subcommittee not presume the existence of some substantial amount at the end of FY 1997?

Dr. Lash. The unobligated balances at the end of FY 1995 consisted primarily of amounts set aside for transfer to the United States Enrichment Corporation and for budget offsets. A transfer of $40,370,000 to the United States Enrichment Corporation is scheduled in FY 1996 to meet part of the Departments' responsibilities for safety upgrades to bring the diffusion plants into compliance with OSHA and NRC requirements. In addition, the $25,703,000 carried over as a FY 1996 budget offset is being utilized to fund FY 1996 Uranium Programs activities. The $17,266,000 projected unobligated balance at the end of FY 1996 represents the FY 1997 budget offset and will be utilized to fund FY 1997 Uranium Programs activities. All of these funds are part of the FY 1993 reprogramming of $197,979,000 within the Uranium Supply and Enrichment Activities appropriation to manage responsibilities left with the Department after the formation of the United States Enrichment Corporation. There will be no reprogramming funds left after FY 1997, nor are any other unobligated balances projected for the end of FY 1997.

PMA PRIVATIZATION

Mr. Myers. On March 16, 1995 the Committee was informed that legislative language to privatize the Southeastern, Southwestern, and Western Power Marketing Administrations would be forwarded "as soon as possible." This year, the proposals were not included in the budget. What has changed in the last year to reverse the decision to privatize the PMA's?

Mr. Simpson. On May 3, 1995, the Department transmitted a draft bill to Congress proposing the sale of Southeastern, Southwestern and Western Area Power Administrations to existing firm power customers at their discounted net present value. This draft legislation was never introduced. Several bills calling for a PMA sale in some form were introduced; however, these bills were controversial and no PMA sale proposal passed the Congress last year. The Administration is willing to consider constructive proposals from existing customers and other stakeholders to improve the current structure of the PMAs. The Administration believes that competitive pressures over time will bring about a restructuring of the Federal power system.

WHOLESALE TRANSMISSION SERVICE

Mr. Myers. The Energy Policy Act of 1992 requires that PMA's with high voltage transmission systems provide wholesale transmission service to new and existing customers. What impact has this legislation had on PMA budgets? Is there an expectation that new construction will be needed to comply with the Act?

Mr. Simpson. As a result of the Energy Policy Act, there have not been any requests for transmission services on Federal transmission lines that have required upgrades or additions. Should a request for transmission require an upgrade to existing or construction of new Federal transmission facilities, the party requesting the transmission would have to pay for the cost of this work. The PMAs would only perform such work that is within the authority provided by Congress.

Bonneville has not changed its transmission budget as a result of this legislation. Bonneville budget reductions are based upon market conditions in the electric utility industry in the northwest and our need to be competitive in order to serve rate payers, accomplish our public responsibilities, and continue timely Treasury repayment of the FCRPS debt.

Bonneville anticipates that, in part due to the legislation, there will be additional opportunities for customers to share in the costs of planned transmission projects. This may ultimately result in a reduced need for BPA transmission construction and a reduced BPA budget.

Bonneville anticipates there may be new construction required to comply with the Act. However, no such new construction was included in the current budget. Cost sharing will be pursued for any requests that would require new construction.

Southeastern Power Administration, as a transmission dependent utility, has had a dramatic change in the way it negotiates transmission arrangement with investor-owned utilities. Southeastern has one Section 211 filing against an investor-owned utility pending before FERC, and is poised to file a second Section 211 against another investor-owned utility. Southeastern has intervened in five proforma tariff filings before FERC, one of which is a nonjurisdictional filing by a preference customer.

This legislation has caused Southwestern to plan and execute activities consistent with the requirements of the Act. To date, the greatest adjustment has been the development, purchase, and installation of the Supervisory Control and Data Acquisition System, with modifications along the way to accommodate the open access provision. Additional requests may necessitate the construction of new facilities, if existing facilities are insufficient to accommodate future customer requirements. Any new facilities required to accommodate customer requests would be paid by the requestor through Southwestern's reimbursable program. Depending on the terms and conditions of the sales agreement, Southwestern may or may not retain ownership. If the new construction is an integral part of its power system, Southwestern would want to retain ownership. In addition, increased requests for transmission service have placed a significant burden on Southwestern's human resources in the operations area. Staffing adjustments may be required to accommodate these

new requests.

There has been no impact on Western Area Power Administration's construction budget as a result of this legislative requirement because Western has assumed that any new transmission line construction will be financed by the requestor.

STREAMLINING

Mr. Myers. Please quantify the actual savings at each of the Power Marketing Administrations (PMAs) from the reduction in the number of DOE Orders and internal regulations. As a result of the Department's announced streamlining efforts, are the PMAs now operating in an environment similar to that of a nonfederal utility company?

Mr. Simpson. I will ask each PMA Administrator to respond.

Mr. Linke. APA has not performed a study to determine the actual savings from the reduction in the number of DOE Orders and internal regulations. However, in support of DOE's Strategic Plan and the National Performance Review recommendations, APA has developed a Strategic Plan that guides the agency toward the transfer of APA assets, while maintaining a quality management-based organization. APA continues to streamline and reorganize into a customer-focused agency. APA has reduced supervisory positions by 70%, acquisition specialist positions by 75%, and eliminated several "no-value" in-house reporting requirements.

Mr. Hardy. Bonneville is a reinvention laboratory as part of the Administration's National Performance Review. The Department has provided administrative relief to Bonneville from significant barriers in the area of personnel, procurement, finance, budget and litigation. Using a conservative analysis of the cost savings that could be quantified, Bonneville found direct savings in FYs 1994 and 1995 of $1.7 million arising from the Department explicitly granting Bonneville an exemption or a waiver from orders and internal regulations. While we have not quantified the total savings to Bonneville and its ratepayers from the Department's actions alone, we expect that the indirect savings associated with the exemptions and waivers are many times this figure.

Bonneville's successful reinvention efforts have allowed Bonneville to reduce its work force since the time the Competitiveness Project began by almost 500 employees through such means as Voluntary Separation Incentive Payments (VSIs). The total savings from current waivers, exemptions and other administrative actions by DOE and other Federal agencies include about $15 to $30 million in procurement and property management, $.5 million in real estate, $.2 million in finance, $.3 to $.6 million in information resources and $26 to $28 million in payroll due to the VSIs.

To create an environment for Bonneville that is similar to a nonfederal utility company, legislation must be enacted. This action would increase our flexibility in the areas of personnel, procurement, finance, budget and litigation and would make permanent the relief obtained administratively as a well as relieve Bonneville from additional administrative burdens some of which are statutory in nature. Nevertheless, Bonneville has been able to capture efficiencies. These efficiencies include developing faster, more customer-oriented solutions to operational and financial problems. The annual cost savings that have resulted from the current waivers and other administrative actions under existing law are considerable, but represent only a portion of the potential savings that Bonneville might be able to achieve if it were allowed to operate in a more business-like manner.

Mr. Borchardt. Southeastern has not made a definitive study of the actual savings from the reduction of DOE Orders and internal regulations. Southeastern is operating in most respects in an environment similar to that of a non-Federal utility company. However, there are some areas that remain very federally oriented, such as personnel, accounting, budget, procurement, and rates.

Mr. Deihl. While Southwestern has not conducted a detailed analysis, we believe there have been efficiency improvements in the procurement area. The personnel, accounting, and budget functions remain essentially unaffected. In support of the Department's Strategic Plan and consistent with the National Performance Review, Southwestern has reduced its support service contracts, travel costs, supervisor-to-employee ratios and streamlined its field maintenance organization.

Mr. Shafer. The Western Area Power Administration (Western) is currently in the process of conducting a detailed analysis of this issue and identifying potential savings. A "Freedom From Regulation" team was recently formed to assist Western in moving toward becoming more businesslike and less bureaucratic. The primary objective of this team is to identify burdensome rules and regulations that are impeding Western operations and hindering customer service. In conjunction with this effort, the team will identify the burden hours and financial costs associated with complying with these rules and regulations. We anticipate that the team will complete their final report on or before April 30, 1996. Western's operations are still more regulated that a non-Federal utility company.

Western is also embarking on the second phase of its Strategic Plan. To date, we have reduced our workforce by almost 11 percent. We are delayering management and significantly increasing the supervisor-to-employee ratio from 1:5 in May 1994 to an estimated 1:8 to June 1996. The number of organizational units are being reduced from 192 in May 1994 to an estimated 121 by June 1996. These steps and other cost containment decisions have resulted in cost savings in FY 1995 and FY 1996. Western's commitment to its customers is to limit growth of annual operating expenses to no more than two percent per fiscal year through FY 1996. This commitment is also reflected in our FY 1997 budget request.

ENERGY POLICY ACT

Mr. Myers. The Energy Policy Act of 1992 increased access to the electric transmission grid for non-utility generators and utilities seeking to wheel power into non-native markets. How has this impacted the PMAs?

Mr. Simpson. For Western Area, Southeastern, and Southwestern Power Administrations the following response is applicable. The Bonneville Power Administration will respond separately.

Even before the Energy Policy Act of 1992, these PMAs generally had an open access policy on their transmission lines. In response to FERC's notice of proposed rulemaking (NOPR) on open-access and nondiscriminatory transmission services, the Department of Energy, on October 4, 1995, issued a policy statement. This statement supported the purposes of the FERC NOPR to bring about a unified national approach to open access transmission services. The policy statement also declared that each PMA that owns transmission facilities will publish generally applicable open-access, wholesale-transmission tariffs and will take service itself under such tariffs and other measures required of transmission owners and operators regulated by FERC's final rule on open-access and nondiscriminatory transmission services, to the extent not otherwise prohibited by law.

The PMAs are not jurisdictional with respect to the applicable provisions of the Federal Power Act (FPA) on which FERC is basing its rulemaking. However, the PMAs with transmission facilities are subject to and are eligible under Section 211 of the FPA, by which FERC may issue orders for mandatory transmission services. While not jurisdictional under the FERC NOPR, the three PMAs plan to comply with the intent of the FERC NOPR. The two PMAs with transmission facilities (Western and Southwestern) are developing their equivalent to the comparable transmission tariffs that will substantially conform with the FERC final rules on open-transmission access and nondiscriminatory transmission services to the extent not otherwise prohibited by law.

The Western Area Power Administration has joined two voluntary regional transmission groups (RTGs), and is working with the formation of a third RTG in the Mid-American Power Pool (MAPP) reliability council of North American Electrical Reliability Council (NERC). FERC certifications of RTGs require members of RTGs to offer comparable transmission services to other members. WAPA will comply with the rules of the RTGs it joins.

Southeastern Power Administration, as a transmission dependent utility, has had a dramatic change in the way they negotiate transmission arrangements with investor-owned utilities. Southeastern has one Section 211 filing against an investor-owned utility pending before FERC, and is poised to file a second Section 211 against another investor-owned utility. Southeastern has intervened in five proforma tariff filings before FERC, one of which is a nonjurisdictional filing by a preference customer.

This legislation has caused Southwestern to plan and execute activities consistent with the requirements of the Act. To date, the greatest adjustment has been the development, purchase, and installation of the Supervisory Control and Data Acquisition System, with modifications along the way to accommodate the open access provision. Additional requests may necessitate the

construction of new facilities, if existing facilities are insufficient to accommodate future customer requirements. Any new facilities required to accommodate customer requests would be paid by the requestor through Southwestern's reimbursable program. Depending on the terms and conditions of the sales agreement, Southwestern may or may not retain ownership. If the new construction is an integral part of its power system, Southwestern would want to retain ownership. In addition, increased requests for transmission service have placed a significant burden on Southwestern's human resources in the operations area. Staffing adjustment may be required to accommodate these new requests.

At this time there have been no budget impacts to the three PMAs, related to transmission construction, as result of open access provisions of the Energy Policy Act.

Mr. Hardy. The major impact on Bonneville of the Energy Policy Act of 1992 has been on our power business. Some of the requests made to Bonneville under the Act deal with the traditional services that Bonneville has always provided, as I mentioned. However, some of the more recent requests are from utilities and marketers that have made special offers to Bonneville's existing customers, and have requested transmission service under the Energy Policy Act to reach those customers. This has resulted in a loss of load for Bonneville. However, Bonneville has denied some of these requests because of our existing contractual obligations to serve those customers.

Although Bonneville has not seen any requests from non-utility generators, we have received several transmission service request from marketers. There are also some developers that are studying projects and Bonneville may be providing technical assistance to them.

REVOLVING FUND

Mr. Myers. What steps would be necessary to establish a revolving fund for each PMA in fiscal year 1997 to reduce the need for appropriations?

Mr. Simpson. The Bonneville Power Administration presently has a revolving fund, and the Western Area Power Administration (Western) has a revolving fund for part of its operations. For the remainder of Western and for the other PMAs, authorizing legislation would need to be passed by Congress to establish a revolving fund. The U.S. Treasury would need to establish a special account on behalf of each PMA. This would give the PMAs authority to expend money from the separate "special accounts" for annual on-going costs such as operation and maintenance, purchase power and wheeling and/or capitalized investments without annual appropriations. Provisions would be necessary to provide working capital.

Mr. Myers. What appropriations savings would result?

Mr. Simpson. The appropriations savings would be the total FY 1997 appropriation request of all the PMAs except Bonneville or $270.7 million. Receipts to the U.S. Treasury would decrease by the same amount.

Mr. Myers. What legislation would be required to establish a revolving fund for each?

Mr. Simpson. The Administration, including the Department of Energy and the Power Marketing Administrations, has no proposal pending to convert additional PMAs to revolving fund status at this time.

WIDESPREAD USE OF ENERGY

Mr. Myers. Can the Department demonstrate that under current policies the power sold by the PMAs results in the most widespread use of energy from projects owned by the federal government?

Mr. Simpson. Federal hydropower is distributed in the most widespread manner feasible. The most widespread use requirement of the Flood Control Act of 1944 and Reclamation Law must be balanced with other requirements of the same Acts, such as lowest possible cost, sound business principles, and the "preference" principle. The PMAs, except for Bonneville, allocate power through a public involvement process which considers the most widespread use of energy in determining to whom power is allocated. For example, the Southwestern Power Administration markets power to 95 percent of the rural electric cooperatives and approximately 30 percent of rural towns in all areas of the six central Southwestern States (Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas),

I will ask Mr. Hardy to respond for the Bonneville Power Administration.

Mr. Hardy. Yes. The power sold by Bonneville currently is consumed by a diverse group of residential, commercial, irrigation, and industrial customers located in a geographic area that spans the four states of Oregon, Washington, Idaho, Montana, and parts of Nevada and California. Bonneville sells power that is distributed through 147 publicly owned utilities and 12 privately owned utilities located in both rural and urban areas in the Pacific Northwest region, and power that is sold directly to 10 Federal agencies and 16 direct services industries.

However, due to the changing, deregulated power markets, Bonneville's utility and direct service industrial customers are actively seeking to diversify their power resource portfolios to take advantage of other competitively priced power offered by other suppliers in the market. Bonneville negotiated with its direct service industrial customers in the fall of 1995 and was successful in retaining a large portion of this load. Bonneville currently is in negotiation with its public utility customers and hopes to be equally successful in retaining a large portion of this load as well, while still allowing these utility customers the opportunity to diversify their resource portfolios. In addition, in 1995, Congress gave Bonneville greater flexibility to market surplus power outside the Northwest. Bonneville can sell power in any region without resale restrictions, giving it the ability to do business with power marketers, load aggregators, and brokers, thereby spreading further the benefits of power generated at Federal projects.

COMPETITIVE BIDS FOR FEDERAL POWER

Mr. Myers. If the power generated by government-owned facilities were made available to all interested purchases on the basis of competitive bids, would this result in an increase in revenues to the federal government from such sales?

Mr. Simpson. Generally, revenues to the U.S. Treasury would increase if power generated at government-owned facilities were sold in a competitive bid process.

I will ask Mr. Hardy to respond for the Bonneville Power Administration.

Mr. Hardy. If the power generated in the Columbia Basin and currently marketed by Bonneville were released to competitive bid, Bonneville believes the result would be a reduction in revenues because of current low electricity prices. The western region is in energy surplus characterized by an oversupply of generation, abundance of spot market power, the emergence of new power suppliers, such as marketers and independent power producers, and low gas prices. Bonneville's rates, and those of most other utilities for long-term, firm power, are above the spot-market price for electricity. For Bonneville, this has been demonstrated time and again when the agency has responded to requests for proposals put forth by utilities in the region and found our electricity to be among the highest prices of all respondents.

Bonneville's average revenue from long-term, firm power sales to its preference customers is currently approximately 2.7 cents per kilowatt-hour. Current West Coast wholesale, short-term prices for multi-month blocks of firm energy are around 1.5 to 2.0 cents per kilowatt-hour. These lower prices are indicative of the revenues Bonneville could expect if it put its power out for competitive bid.

Given these facts, auctioning Bonneville's power to the highest bidder is likely to reduce, not increase, Bonneville revenues. Retaining the load of Bonneville's current firm power customers appears to be the best strategy to sustain our revenues in the near term and most likely in the long term as well.

PMA CUSTOMER FUNDING

Mr. Myers. Has any progress been made on a proposal to have PMA customers provide upfront funding for improvements to facilities? Please provide information that will be helpful in evaluating these proposals.

Mr. Simpson. I will ask each of the PMAs to respond.

Mr. Linke. In accordance with Public Law 104-58, signed by the President on November 28, 1995, the Snettisham project will be sold to the State of Alaska and the Eklutna Project to the three current power customers, Municipal Light and Power, Chugach Electric Association, Inc., and Matanuska Electric Association, Inc. DOE and APA expect to complete the sale of the Eklutna Project by early 1997 and continue to pursue the necessary tax-exempt financing legislation for the completion of the sale of the Snettisham Project to the State of Alaska.

Mr. Hardy. Bonneville has two general classes of transmission projects for which we may seek up-front funding for facility additions or improvements. With the first type of project, reimbursable projects, customers reimburse Bonneville for actual costs incurred in the construction of new or improved customer-owned facilities. A deposit or letter of intent is requested in advance. Reimbursable construction by Bonneville is undertaken at customer expense for the customers's direct benefit, but also benefits Bonneville.

The second class of facilities funded by customers Bonneville has defined as "Projects Funded in Advance" by others. These projects involve facilities that will be Bonneville-owned, but funded by customers in advance of the work. Bonneville will be seeking more customer financial involvement in Bonneville construction. This is just good business for Bonneville and the Government, not the result of legal requirement.

Mr. Borchardt. Southeastern, working with preference customers and the U.S. Army Corps of Engineers, is studying alternative financing methods to allow preference customers to pay for replacements and rehabilitations at the Corps of Engineers' projects.

Mr. Deihl. Proposed improvements to Southwestern transmission facilities are evaluated on a case-by-case basis to determine if a portion or all of the improvement should be funded by a customer or group of customers and if the improvement would benefit a single customer, a group of customers, or all customers. An evaluation is also made to determine if the project is needed to support the delivery of Federal or non-Federal power. If it is determined that any part of the project should be funded by customers under Southwestern's reimbursable authority, then up-front funding is provided by the customers in an escrow account before the project proceeds. Any unused funds are returned to the customers.

Southwestern has had experience in up-front funding of new hydropower generation. In the mid- 1980's, the Robert D. Willis Project was developed using non-Federal up-front financing. A construction agreement was signed between the Army Corps of Engineers (Corps), the non-Federal sponsor, and Southwestern. Since the Corps was doing the project construction, an escrow agreement was signed between the Corps and

the non-Federal sponsor. The non-Federal sponsor placed financing in the account in accordance with the agreement. A power sales contract between Southwestern and the non-Federal sponsor was signed since the project was to be owned and operated by the Corps. The three-party arrangement provided benefits to all parties.

Southwestern believes that power customers are willing to consider up-front funding when the improvements are proven to be beneficial and needed, an assurance is provided that funds will be properly credited in the repayment process, and the customer will continue to receive the benefits of the improvement.

Mr. Shafer. Western Area Power Administration is working closely with its various power customer groups throughout its service area to build a better understanding among the customers of Western's budget cycle and decision-making processes. Very preliminary discussions concerning their willingness to provide up-front financing (advance funds) for Bureau of Reclamation and Western costs are taking place with the Central Valley Project, Parker-Davis Project, Loveland Area Projects, and Pick-Sloan Missouri Basin Program (Eastern Division) customers.

Examples of historic alternative financing for improvements to facilities are modifications to Buffalo Bill Dam and Shasta Generator Rewinds. A contract was signed in 1984 by the State of Wyoming, Bureau of Reclamation, and Western to repay funds advanced by the State for portions of Buffalo Bill Dam modifications. The advanced funds are being repaid, with interest, through power revenues. In 1995, contracts were negotiated among Western, Reclamation, and several Central Valley Project power customers whereby the customers advanced funds for the Shasta Powerplant generator rewinds. The customers will be reimbursed for their investment through credits on their power bills.

Western believes that alternative financing is a good business practice because it reduces the need for larger annual appropriations while providing a means to accomplish our mission in a climate of budgetary constraint. Our FY 1997 budget request includes alternative financing for a portion of our purchase power and wheeling program, which has been historically disclosed. Western will keep you informed of any specific proposals for inclusion in future budget requests.

SALE OF WHOLESALE POWER
DEBT TO TREASURY

Mr. Myers. Please provide tables displaying the following estimates for FY's 1994, 1995, 1996 and 1997 (if available): composite wholesale power rates and debt repayment schedule.

Mr. Simpson. Mr. Myers, I will provide for the record tables showing the composite rate and the debt repayments schedules for each PMA. In the table for the composite rates Western's is the average of firm composite rates of all Western projects. The rate for each Western project reflects the differences in project age and project diversity inherent in its large service area. No one rate can be indicative of area conditions when Western's service area cover 15 states. Therefore, I will provide a second composite rate table for the record showing the composite rate for each Western project.
(The tables follow:)

Power Marketing Administrations
Composite Wholesale Power Rates
for FY 1994, FY 1995, FY 1996, and FY 1997

	FY 1994	FY 1995	Estimated FY 1996	Estimated FY 1997
Alaska Power Administration	2.51 cents/kWh	2.57 cents/kWh	2.75 cents/kWh	2.86 cents/kWh
Bonneville Power Administration[1]	2.56 cents/kWh	2.68 cents/kWh	2.55 cents/kWh	2.48 cents/kWh
Southeastern Power Administration[2]	1.98 cents/kWh	2.27 cents/kWh	2.12 cents/kWh	2.12 cents/kWh
Southwestern Power Administration[2]	2.92 cents/kWh	2.87 cents/kWh	2.85 cents/kWh	2.84 cents/kWh
Western Area Power Administration[3]	1.80 cents/kWh	1.84 cents/kWh	1.64 cents/kWh	1.68 cents/kWh

1/ Excludes capacity sales

2/ Peaking capacity and energy

3/ Average of firm composite rates of all Western projects

Western Area Power Administration
Composite Wholesale Power Rates by Project
for FY 1994, FY 1995, FY 1996, and FY 1997

	FY 1994	FY 1995	Estimated FY 1996	Estimated FY 1997
Boulder Canyon Project	1.26 cents/kWh	1.26 cents/kWh	1.18 cents/kWh	1.18 cents/kWh
Central Valley Project	2.99 cents/kWh	2.99 cents/kWh	2.34 cents/kWh	2.66 cents/kWh
Loveland Area Projects	2.01 cents/kWh	2.17 cents/kWh	2.17 cents/kWh	2.17 cents/kWh
Parker-Davis Project	1.16 cents/kWh	1.20 cents/kWh	.63 cents/kWh	.63 cents/kWh
Pick-Sloan Missouri Basin Program (Eastern Division)	1.33 cents/kWh	1.42 cents/kWh	1.42 cents/kWh	1.42 cents/kWh
Salt Lake City Area Integrated Projects	2.02 cents/kWh	2.02 cents/kWh	2.02 cents/kWh	2.02 cents/kwh

PMA Principal Repayment Detail
(Dollars in Millions)

PMA	Actual FY 1994	Actual FY 1995	Estimated FY 1996	Estimated FY 1997	Total Unpaid Federal Investment Thru FY 1995
Alaska	$ 2.3	$ 2.0	$ 1.7	$ 1.7	$ 164
Bonneville	191.0	476.0[1]	267.0	263.0	9,975
Southeastern	33.2	32.8	34.1	29.7	986
Southwestern	32.2	36.5[2]	23.8	24.1	641
Western	41.0[3]	40.0[4]	27.0	18.0	3,889

1/ Includes a projected $156 million capital transfer in FY 1995 representing an unscheduled amortization payment connected with receipts from sale capacity to non-Federal participants in the AC Intertie transmission lines. Amount and year of this capital transfer are subject to change pending conclusion of the sale.

2/ The FY 1995 figure is higher than the subsequent years. The FY 1996 and FY 1997 estimates are based on average year projections.

3/ Excludes prior year adjustments.

4/ Repayment of Federal investment only.

PMA CUMULATIVE INVESTMENT

Mr. Myers. Please provide a table showing cumulative investment for each PMA, the receipts to date and how these receipts have been used to offset operating expenses, to repay interest, investment costs and other purposes, and the remaining unpaid investment.

Mr. Simpson. I would like to insert the following table for the record. It presents the PMAs' cumulative revenues and status of repayment through FY 1995.
(The table follows:)

Status of Repayment as of September 30, 1995[1]
(Cumulative Dollars in Millions)

PMA	Power Investment[2]	Power Revenues	Operations and Maint.	Purchased Power	Interest Expense	Cumulative Repayment	Unpaid Investment
Alaska	208	165	58	0	63	44	164
Bonneville	13,058	41,065[3]	6,618	24,676	6,688[4]	3,083[3]	9,975[4,5]
Southeastern	1,487	2,643	1,209	74	859	501	986
Southwestern	1,007	2,265	787	541	571	366	641
Western	6,320	12,566[6]	4,792	3,382	2,292[7]	2,264[8]	4,056[5,8]
PMA total	22,080	58,704	13,464	28,673	10,473	6,258	15,822

1/ All data are on accrual basis of accounting, except as noted, and are based on the best information available.

2/ The power investment to be repaid includes irrigation and other nonpower and non-Federally financed investment assigned to power for repayment for Bonneville and Western.

3/ Cash rather than accrual basis.

4/ Interest is net of AFUDC (capitalized interest).

5/ The unpaid investment does not include construction work in progress (Bonneville: $140 million; Western: $363 million) or net capitalized deficits (Western: $181 million).

6/ Net of income transfers of $249 million. Also, $16 million of revenues reported here are fund balances for the Boulder Canyon Project that are not accounted for in any column.

7/ Includes $181 million on which payment was deferred. This interest will be repaid with interest.

8/ Consists of both Federal and non-Federal investments.

OPERATING FACILITIES AND CAPACITIES

Mr. Myers. Please provide a table showing for each PMA the installed generating capacity marketed, the number of generating plants serviced, the number of substations owned, the length of transmission line owned, and the most recent replacement cost all of facilities.

Mr. Simpson. I will provide the information for the record.
(The information follows:)

PMA STATISTICS
(As of the end of FY 1995)

PMA	Installed Capacity (MW)	Plants	Number of Substations	Transmission Lines (Miles)	Replacement Costs (Millions)
Alaska	108[1]	2	4	88	$ 375[2]
Bonneville	20,212[3]	30	400	14,800[4]	4,700[4]
Southeastern	3,092	23	0	0	[5]
Southwestern	2,158	24	24	1,380	[5]
Western	10,581	56	257	16,760	[5]
PMA total	36,151	135	685	33,028	

1/ Alaska owns and operates their generation facilities.

2/ Replacement cost less depreciation based on asset valuation study by Coopers & Lybrand, 1986, updated by Alaska, 1996.

3/ Instantaneous generating capacity (peak MW).

4/ No replacement cost study has been prepared; this is the total plant investment in transmission facilities owned and operated by Bonneville in historical dollars. Replacement cost may not be relevant in an era of competition, since cost of complete replacement may not be recoverable.

5/ Studies have not been conducted to estimate replacement cost.

PMA NET GENERATION

Mr. Myers. For each PMA, please identify by type, the net generation of electricity in FY 1995, and estimated net generation for FY's 1996 and 1997. What percent of each region's power is supplied by each PMA?

Mr. Simpson. I will provide a table for the record.
(The table follows:)

Net Generation (Mwh)

PMA	Type	FY 1995 Actual	FY 1996 Estimate	FY 1997 Estimate	% of Region's Power Supplied by PMA
APA	Hydro	414,000	417,000	394,000	9%
BPA	Hydro	72,200,000[1]	62,389,000[2]	62,765,000[3]	40%
	Nuclear	7,166,000	7,192,000	7,375,000	
	Other	1,297,000	917,000	957,000	
SEPA	Hydro	6,828,571	8,025,000	8,050,000	2%
SWPA	Hydro	7,755,000	5,171,400[4]	5,186,000	4%
WAPA	Hydro	28,794,000	26,601,000	26,337,000	7%
	Thermal[5]	4,116,000	4,116,000	4,116,000	

1/ Includes secondary energy, which varies according to actual water conditions.

2/ Firm capability, no secondary energy included.

3/ Firm capability, no secondary energy included; does not include effects from the 1995 Biological Opinion, which is expected to reduce energy producing capability by 700 average Megawatts per year.

4/ FY 1996 and FY 1997 estimates reflect average year generation based on estimates in the FY 1995 Power Repayment studies.

5/ Western markets the generation from the 547 megawatts of the Government's share in the Navajo Powerplant that is in excess of the needs of the Central Arizona Project.

FTE LEVELS

Mr. Myers. For each PMA, please provide FTE levels for FY 1995, 1996 and 1997.

Mr. Simpson. I will provide a table for the record on PMA FTE levels.
(The table follows:)

PMA FTE LEVELS

PMA	Actual FY 1995	Estimated FY 1996	Estimated FY 1997
Alaska	30	35	34
Bonneville	3,313	3,272	3,272
Southeastern	42	41	40
Southwestern	196	195	192
Western [1]	1,417	1,417	1,387
PMA Total	4,998	4,960	4,925

[1] Figures reported for Western are usage levels.

PMA UNOBLIGATED BALANCES

Mr. Myers. For each of the PMA's please provide unobligated balances for FY's 1994, 1995 and an estimate of unobligated balances for FY 1997. Please provide details of the source of the balances.

Mr. Simpson. I will provide a table for the record showing the unobligated balances. I will ask each PMA to discuss the source of the balances.
(The table follows:)

Unobligated Balances
(Dollars in Thousands)

PMA	FY 1994 Actual	FY 1995 Actual	FY 1997 Estimated (beginning of year)
Alaska	$376	$327	$200
Bonneville	29,000	144,000	143,000
Southeastern	18,218	17,032	6,595
Southwestern	10,054	1,630	1,204
Western	92,451	58,457	30,800

Mr. Linke. Alaska Power Administration's unobligated balances in FY 1994, FY 1995, and FY 1997 include the $200,000 emergency fund appropriated by Congress in FY 1984. This fund is to ensure continuity of service during an emergency. The remaining unobligated balances are due to contract awards being lower than estimated, and reduced travel, transportation, and personnel costs.

Mr. Hardy. For Bonneville, these amounts are permanent, indefinite financial resources, including reserves, available for obligation by the Bonneville Administrator, through the BPA revolving fund. Bonneville's unobligated balances reflect primarily the time lag between obligation and outlay of funds for capital programs, which consist predominantly of multi-year funding requirements. The difference between Bonneville's unobligated balances in FY 1994 and FY 1995 reflects the one-time impact of Bonneville's shift of its internal management control from budget obligations to accrued expenditures. This shift of focus from how fast approved funding is consumed to a focus on matching budget and accounting events to cash payment needs better controls Bonneville's business-based programs and more closely coordinates Bonneville's budget and rate processes.

Mr. Borchardt. The unobligated balance for FY 1994 was $18,218,000.. This balance was due to lower than anticipated purchased power and wheeling costs and outages at the Carters Project. The

unobligated balance for FY 1995 was $17,032,000. This balance was due to better than average water conditions and lower purchased power and wheeling costs. Southeastern will apply $6,545,000 of unobligated balances carried forward from FY 1995 to FY 1997 and $10,059,000 from FY 1995 to FY 1996. The balance shown for each year also includes Southeastern's unused $50,000 permanent, indefinite continuing fund appropriation.

Mr. Deihl. Southwestern's unobligated balances in Operations and Maintenance, Construction, and Purchased Power and Wheeling are the results of prior year deobligations, lower than estimated purchased power and wheeling costs, reductions in support service contracts, and awarded contracts lower than budgeted. Southwestern's permanent, indefinite appropriation of $300,000 for continued power service during emergency conditions is also reflected as an unobligated balance due to average or above average water conditions for the last 2 years.

Mr. Shafer. Western had a FY 1994 unobligated balance of $92,451,000 which carried forward into FY 1995. The majority of that amount ($63,600,000) was associated with Congressionally-directed financing of the FY 1995 program ($61,400,000 from the Western/Pacific Gas & Electric settlement, $400,000 from support services contract savings, and $1,800,000 directed by the FY 1995 Energy & Water Development Appropriations Conference Report to offset a reduction in budget authority for the Navajo Transmission Project in the Construction and Rehabilitation program). An additional $5,000,000 of FY 1994 unobligated balances is being used to finance the FY 1996 program. Western surrendered $10,000,000 of the FY 1994 unobligated balances to DOE early in FY 1995 for proposed transfer to the Energy Supply R&D appropriation. The remaining $13,900,000 was primarily attributable to delay of contract award for replacement of a supervisory control and data acquisition system for the Pick-Sloan Missouri Basin Program.

Western had a FY 1995 unobligated balance of $58,500,000 million which carried forward into FY 1996. Of that amount, $17,700,000 was associated with Congressionally-directed financing of the FY 1996 program ($11,400,000 is a result of delay or cancellation of construction replacements and upgrades, and $6,300,000 is a result of the hiring freeze and an aggressive cost reduction program in concert with our customers). An additional $19,000,000 of the FY 1995 unobligated balances will be used to finance the FY 1997 program. Western surrendered an additional $5,500,000 of FY 1995 unobligated balances early in FY 1996 to be included in DOE's FY 1996 supplemental budget request for the Alaska Power Administration. The remaining FY 1995 unobligated balances will be used primarily to finance Western's transformation effort. Western anticipates no unobligated balances at the end of FY 1997. Western will apply $30,800,000 from FY 1996 to FY 1997 ($18,800,000 is a result of delay or cancellation of replacements and upgrades and $14,600,000 due to improved water conditions and increased competitiveness in the energy market) to finance its FY 1997 program.

ALASKA CLOSEOUT COSTS

Mr. Myers. Last year, the Committee was informed that closeout costs at the Alaska Power Administration would be in the $3,500,000 to $5,500,000 range. The continuing resolution now in conference between the House and Senate includes $5,500,000 for costs associated with selling these assets. What factors contributed to the request coming in on the high side?

Mr. Linke. The FY 1996 Supplemental funding request in the continuing resolution is the high estimate of what APA will need to close out the agency. The factors contributing to the high end estimate include:

- Uncertainty as to whether existing Eklutna Project rights-of-way are transferable to non-Federal ownership. If the rights-of-way are not transferable, APA may have to purchase or otherwise acquire transferable rights-of-way.

- Completing the as-built survey of the Eklutna transmission line as quickly as possible has increased the survey cost $200,000, from the $550,000 to $750,000.

- Uncertainty as to how many employees will find work locally, how many will require relocation and how much each relocation will cost (APA has agreed to pay relocation costs to another Federal position), or how many employees will leave Federal employment and be entitled to severance benefits. APA has based the estimate on a worse case scenario, in order to ensure adequate funding for these personnel costs and benefits.

- The unanticipated requirement for APA to make a determination as to whether or not the projects are eligible for listing on the National Register of Historic Places under the National Historic Preservation Act needs to be completed. If the projects are eligible, the transfer from Federal ownership to non-Federal ownership is deemed an adverse action under the terms of the Act. Mitigating the adverse impact, if any, of the transfer may take over a year, with potentially substantial costs involved.

- A determination of what, if anything, needs to be done to correct environmental, safety, and engineering deficiencies at the Eklutna Project, and the corresponding costs of these corrections.

Mr. Myers. Will this be the last request for closing costs?

Mr. Linke. APA does not anticipate requesting any additional funds for closeout activities. APA will need operation and maintenance funds until the actual transfer date of each project. It is possible that unexpected costs could arise as the date of transfer moves further into the future.

SALE OF ALASKA

Mr. Myers. When will the sale of the Alaska Power Administration be completed?

Mr. Linke. The transfer of the Snettisham Project cannot start until Congressional authorization is enacted for the State of Alaska's use of tax-exempt private activity bonds to purchase that project. APA expects the process to take from twelve to eighteen months from the time tax-exempt bonding is approved until the transfer can take place. This is primarily based on time the State of Alaska needs to obtain the financing.

The transfer of the Eklutna Project is underway. A transition plan will be completed by May 28, 1996, as required by the Eklutna Purchase Agreement. The transition plan will set a transaction (transfer) date. The current window for the transaction date is October 1, 1996, to November 28, 1997. However, APA expects the transfer to take place in early to mid-1997. The actual transfer date will depend on how soon APA can overcome the remaining hurdles to the transfer process.

Mr. Myers. What additional costs will be incurred if the sale is delayed?

Mr. Linke. APA is responsible for the cost of operating and maintaining the projects until the transaction date. This would include costs for continuing the existing maintenance programs and replacing failing equipment. If the last project is transferred after the end of FY 1997, current APA estimates may not include enough funding to cover inflation of previously estimated costs.

Mr. Myers. For the record, what hurdles remain before we sell these assets?

Mr. Simpson. The following hurdles to the completion of the asset transfers exist at this time, however, additional hurdles may be uncovered as we proceed:

- A determination as to whether or not the projects are eligible for listing on the National Register of Historic Places under the National Historic Preservation Act needs to be completed. If the projects are eligible, the transfer from Federal ownership to non-Federal ownership is deemed an adverse action under the terms of the Act. Mitigating the adverse impact, if any, of the transfer may take over a year, with potentially substantial costs involved.

- APA needs to obtain a Corps of Engineers' permit to transfer the Eklutna Project transmission line rights-of-way that cross military lands. The Corp of Engineers' initial estimates suggest that it may take up to a year to obtain this permit.

- APA needs to complete the lands and rights-of-way surveys and transfer documents for the Snettisham Project.

- Approval for the use of tax-exempt private activity bonds by the State of Alaska for the purchase of the Snettisham Project still needs to be enacted by Congress. The transition plan for the Snettisham Project cannot be completed until this "first use" clarification has been legislated.

The Snettisham purchaser, the State of Alaska, does not anticipate performing the environmental, safety, and engineering reviews of the Snettisham Project until the use of tax-exempt bonds is approved.

APA needs a determination as to whether existing Eklutna Project rights-of-way are transferable to non-Federal ownership. If the rights-of-way are not transferable, APA may have to purchase or otherwise acquire transferable rights-of-way.

- A final determination is required by APA and the Eklutna purchasers of what, if anything, needs to be done to correct environmental, safety, and engineering deficiencies at the Eklutna Project.

Myers. What is the latest estimate of the amount we'll realize from this sale?

Mr. Linke. The following table shows the purchase prices for the Eklutna Project and the Snettisham Project if the transfers were to take place on September 30, 1996, or September 30, 1997. The Snettisham purchase price is based on the projected interest rate of the State bonds and the 30-year Treasury bonds at the time of transfer. The table uses a State tax-exempt bond rate of 6.2% and a 30-year Treasury bond rate of 6.7%.

	September 30, 1996	September 30, 1997
Snettisham Project	$ 74,158,000	$ 74,043,000
Eklutna Project	7,178,000	5,953,000
Total	$ 81,336,000	$ 79,996,000

Mr. Myers. Will the federal government have any commitments after the sale?

Mr. Linke. The Federal government will have to complete whatever activities the Federal government agreed to do and those that were started prior to the transaction dates. It is very likely that all of the property will not transfer on the transaction dates and the Federal government would be obligated to complete the land transfers. It is also possible that some contracting, administrative, and personnel issues will not be resolved within a year of the transfer of APA assets. APA has established a Memorandum of Understanding with Western Area Power Administration that will allow Western to complete these activities after APA terminates. The Alaska Power Administration Asset Sale and Termination Act also requires that a report on the transfer be prepared and submitted to Congress within one year of the last transaction date.

EKLUTNA REWIND

Mr. Myers. Last year, the Committee was told the Eklutna rewind program would be completed in FY 1997. What is the status of this project?

Mr. Linke. The rewind program is on schedule. APA expects the onsite work to begin before the end of FY 1996, with completion by September, 1997.

RICHARD B. RUSSELL PROJECT

Mr. Myers. What is the status of the Richard B. Russell project?

Mr. Borchardt. The environmental testing of the Richard B. Russell pump-back units continues following rigid guidelines imposed by Federal District Court. Two of the four pump-back units have been operated in both the pumping and generating modes with relatively minor fish entrainment. During these tests valuable experience has been gained in the effective use of the various fish deterrent devices and operational procedures.

Environmental testing of all four pump-back units which was originally scheduled to begin in April 1995 was postponed until April 1996 to allow for the installation of enhanced fish protection systems. The Corps is also constructing a diversion dike which will interrupt pumping water currents thereby minimizing the potential for fish entrainment during pumping cycles. Dike construction will be completed prior to the start of Phase III testing. This phase of the testing is scheduled to run through October 31, 1996.

Definitive marketing discussions must be delayed until after the successful completion of the environmental testing of the pump-back units and the District Court is satisfied that fish entrainment will not be a problem at the project.

Mr. Myers. Is the pumpback feature expected to be operational in FY 1996?

Mr. Borchardt. No. If the present schedule holds and the court accepts the Corps proposals on protecting the fish during pumping operations, the commercial availability of the pump-back units could be scheduled for May 1997.

GEORGIA-ALABAMA-SOUTH CAROLINA PROJECT

Mr. Myers. What is the status of negotiations with the Southern Company for continuation of wheeling and other services for the Georgia-Alabama-South Carolina system of projects.

Mr. Borchardt. Our existing contracts with the Southern Companies, (the Georgia, Alabama, Mississippi and the Gulf Power Companies), are extended on a month-to-month basis as we continue negotiations. Recent negotiation sessions have been encouraging, and we anticipate having a negotiating settlement within the next few months. In the event negotiations are not successfully concluded, we will file with the Federal Energy Regulatory Commission for a settlement, and we will pay a tariff and fees at a level determined by FERC under their regulatory authority.

Mr. Myers. How will additional costs be paid?

Mr. Borchardt. Southeastern is planning to obtain funds, where possible, by having the preference customers in the Southern Companies area pay the Southern Companies directly for transmission and control area services.

SEPA OFFICE SPACE

Mr. Myers. Does the FY 1997 budget include funding for new office space?

Mr. Borchardt. The FY 1997 budget does not include any funding for new office space.

SEPA REPAIRS AND MAINTENANCE FUNDING

Mr. Myers. Last year, the Committee was informed that delays in funding repairs and maintenance contributed to higher costs for customers. What is being done to resolve this problem?

Mr. Borchardt. Southeastern is studying a proposal to allow the use of alternative funding arrangements, where Southeastern's preference customers would provide up-front funding to replace and rehabilitate the projects.

Mr. Myers. Is a cost estimate available related to this problem?

Mr. Borchardt. Southeastern has no current studies which estimate the cost to the preference customers.

SHASTA DAM TEMPERATURE CONTROL DEVICE

Mr. Myers. Please provide an update of the Shasta Dam temperature control device. What is the current estimate for bypass reimbursements in FY's 1995, 1996 and 1997? When will the device be operational? What needs to be done to get this finished?

Mr. Shafer. Construction of the Shasta Dam Temperature Control Device is now well under way. The $63.7 million contract to construct the Device was awarded to Fletcher General Inc. in November 1994. After months of site preparation, construction of the actual Device was initiated in January 1996. As of the end of February 1996, the Device was approximately 35 percent completed.

The cost to replace the power foregone due to water releases bypassing the powerplants is estimated to have been $9.8 million in FY 1995. The estimates for FY 1996 and 1997 are $1.6 million and $0.6 million, respectively.

Recent storms in northern California caused some delay in the construction; as such, the Bureau of Reclamation is now forecasting the Device to be in place by the end of October 1996 and testing to begin in November 1996, barring further delays. The Device is anticipated to be operational in December, 1996.

To finish the Device and place it in operation, the construction of the Device must be completed, and testing must show that the Device will operate as designed.

GENERALLY ACCEPTED ACCOUNTING PRINCIPLES

Mr. Myers. Last year, the Committee was informed that Western's financial statements were not consistent with an audit done by Deloitte & Touche. Please provide a detailed explanation for these differences. Please include discussion of any differences in FY's 1992 through FY 1995.

Mr. Shafer. To my knowledge, no audit was performed in 1995 by Deloitte & Touche of Western's operations or financial statements. Last year reference was made by the Alliance for Power Privatization to a review conducted by Deloitte & Touche in January 1995 concerning all the power marketing administrations, but citing Western specifically, as to the use of generally accepted accounting principles (GAAP). Not only does Western use GAAP in preparation of the financial statements but, as outlined in response to the Alliance's statements, Deloitte & Touche were the independent auditors performing the financial statement audits for the Southeastern Federal Power Program in FY 93, specifying in their audit opinion (as reflected in their Annual Report) "the results of operations and its cash flows were ...in conformity with generally accepted accounting principles."

To date, Western has been unable to obtain a copy of the review prepared by Deloitte & Touche. Originally, we were informed that the review was preliminary and had not been released; however, after repeated follow up, Western has yet to acquire a copy of the review with which Western could and would address differences in GAAP reporting.

Additionally, KPMG Peat Marwick, Western's external auditor performs a financial statement audit and issues their opinion based on GAAP. Western has received an unqualified (clean) opinion on the Combined Power System Financial Statements for Fiscal Years 1991, 1992, 1993, 1994, and most recently, 1995. A clean opinion states that the combined power system financial statements "present fairly, in all material respects, the financial position of Western, for those years and the results of its operations and changes in accumulated net revenues, and its cash flows for the years then ended in conformity with generally accepted accounting principles".

USE OF BORROWING AUTHORITY

Mr. Myers. Of the $3.75 billion in borrowing authority provided to Bonneville, how much has been used to date of each increment originally provided, how much has been repaid, and when will the borrowing authority be depleted?

Mr. Hardy. The table, BPA Status of Borrowing, in BPA's FY 1997 Congressional budget submittal showed that as of the end of FY 1995 BPA had made capital obligations of approximately $2 billion under the borrowing authority of the 1974 Federal Columbia River Transmission System Act, and $744 million under the authority of the 1980 Pacific Northwest Electric Power Planning and Conservation Act. As of the end of FY 1995, Bonneville has amortized $312 million of the Federal Columbia River Transmission System Act authority and $66 million of authority provided by the 1980 Northwest Power Act. The borrowing table in the budget forecasts that the Transmission System Act borrowing authority will be depleted in FY 2000 and the Northwest Power Act borrowing authority will be depleted some time after FY 2001.

This table assumes amortization based on Bonneville's Supplemental rate proposal which will be revised with the release of Bonneville's Final rate proposal in May 1996. Also, since completion of Bonneville's FY 1997 Congressional budget submittal, the agency has undergone another review of its proposed spending levels which will result in further reductions in capital investments. It is unlikely that the agency will deplete its borrowing authority under either Act before FY 2001.

FY 1997 CONGRESSIONAL BUDGET SUBMITTAL
BONNEVILLE POWER ADMINISTRATION
BPA STATUS of BORROWING

(in millions of dollars)

BP-4A

FRB 06-Mar-96

	FY 1995				FY 1996				FY 1997			
	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing
Cum. - Start-of-Year: 1974 Act	2,079		1,983		1,996		1,916		2,096		2,027	
Start-of-Year: 1980 Act	751		669		744		677		739		671	
Start-of-Year: Total	2,830	2,788	2,652	2,616	2,739	2,697	2,593	2,563	2,835	2,793	2,698	2,584
Plus: Annual Increase 1/												
Annual Increase: 1974 Act	228		245		260		260		233		239	
Annual Increase: 1980 Act	59		74		105		104		54		75	
Annual Borrowing A. Increase	287	287	319		355	355	364		287	287	314	
Treasury Borrowing (Cash)				325				280				194
Less:												
Bond Amortization: 1974 Act	312		312		149		149		175		175	
Bond Amortization: 1980 Act	66		66		110		110		82		82	
Total BPA Bond Amortization 2/	378	378	378	378	259	259	259	259	257	257	257	257
Net Increase/(Decrease):												
1974 Act	(84)		(67)		101		111		58		64	
1980 Act	(7)		8		(5)		(6)		(28)		(7)	
Total	(91)	(91)	(59)	(53)	96	96	105	21	30	30	57	(62)
Cum. - End-of-Year: 1974 Act	1,995		1,916		2,096		2,027		2,164		2,091	
End-of-Year: 1980 Act	744		677		739		671		711		664	
End-of-Year: Total	2,739	2,697	2,593	2,563	2,835	2,793	2,698	2,584	2,865	2,823	2,755	2,521
Remaining Leg. Borrowing A.:												
1974 Act	506				404				346			
1980 Act	506				511				539			
Total Borrowing Authority	1,011	1,053		1,187	915	957		1,167	885	927		1,229
Total Legislated Borrowing A.	3,750	3,750		3,750	3,750	3,750		3,750	3,750	3,750		3,750

1/ FY 1995 is actuals. FY 1996-2001 are based on the FY1997 Congressional Budget Submittal.
Bonneville is exploring options with its customers and constituents to reduce its level of debt financing in order to both delay the exhaustion of the borrowing authority caps and improve Bonneville's debt-equity position. The options under consideration include: a) further reductions in capital spending through application of a capital budgeting process, b) revenue financing of roughly $15 million of transmission capital and $15 million of fish & wildlife capital per year, c) to the extent allowable, potentially shifting costs from the Transmission /Fish & Wildlife authority to the Conservation authority, and d) exploring alternative sources of capital, including the use of third-party financing to the greatest extent possible. The options to be adopted will be determined through process of developing the 96 Rate Case in May.

2/ FY 1995 is actual. FY 1996-2001 are based on the 1996 Supplemental Rate Proposal and will be updated following completion of Bonneville's 1996 rate case in May.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of BORROWING
(in millions of dollars)

BP-4B

FRB 06-Mar-96

	FY 1998				FY 1999				FY 2000			
	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing
Cum. - Start-of-Year: 1974 Act	2,164		2,091		2,284		2,221		2,418		2,355	
Start-of-Year: 1980 Act	711		664		665		618		706		659	
Start-of-Year: Total	2,865	2,823	2,755	2,521	2,949	2,907	2,839	2,499	3,124	3,082	3,014	2,573
Plus: Annual Increase 1/												
Annual Increase: 1974 Act	272		272		283		283		364		364	
Annual Increase: 1980 Act	52		52		41		41		31		31	
Annual Borrowing A Increase	324	324	324		324	324	324		395	395	395	
Treasury Borrowing (Cash)				218				223				271
Less:												
Bond Amortization: 1974 Act	142		142		149		149		149		149	
Bond Amortization: 1980 Act	99		99		0		0		0		0	
Total BPA Bond Amortization 2/	240	240	240	240	149	149	149	149	149	149	149	149
Net Increase/(Decrease):												
1974 Act	130		130		134		134		215		215	
1980 Act	(47)		(47)		41		41		31		31	
Total	84	84	84	(22)	175	175	175	74	246	246	246	122
Cum. - End-of-Year: 1974 Act	2,284		2,221		2,418		2,355		2,633		2,570	
End-of-Year: 1980 Act	665		618		706		659		737		690	
End-of-Year: Total	2,949	2,907	2,839	2,499	3,124	3,082	3,014	2,573	3,370	3,328	3,260	2,695
Remaining Leg. Borrowing A.:												
1974 Act	216				82				(133)			
1980 Act	585				544				513			
Total Borrowing Authority	801	843		1,251	627	669		1,177	380	422		1,055
Total Legislated Borrowing A.	3,750	3,750		3,750	3,750	3,750		3,750	3,750	3,750		3,750

1/ FY 1995 is actuals. FY 1996-2001 are based on the FY1997 Congressional Budget Submittal.
Bonneville is exploring options with its customers and constituents to reduce its level of debt financing in order to both delay the exhaustion of the borrowing authority caps and improve Bonneville's debt-equity position. The options under consideration include: a) further reductions in capital spending through application of a capital budgeting process, b) revenue financing of roughly $15 million of transmission capital and $15 million of fish & wildlife capital per year, c) to the extent allowable, potentially shifting costs from the Transmission /Fish & Wildlife authority to the Conservation authority, and d) exploring alternative sources of capital, including the use of third-party financing to the greatest extent possible. The options to be adopted will be determined through process of developing the 96 Rate Case in May.
2/ FY 1995 is actual. FY 1996-2001 are based on the 1996 Supplemental Rate Proposal and will be updated following completion of Bonneville's 1996 rate case in May.

DEPARTMENT OF ENERGY
FY 1997 CONGRESSIONAL BUDGET SUBMITTAL
BONNEVILLE POWER ADMINISTRATION
BPA STATUS of BORROWING
(in millions of dollars)

BP 4C

FRB 06 Mar 96

	FY 2001			
	Capital Obligations	Annual Borrowing Authority	Capital Expend.	Treasury Borrowing
Cum. - Start-of-Year: 1974 Act	2,633		2,570	
Start-of-Year: 1980 Act	737		690	
Start-of-Year: Total	3,370	3,328	3,260	2,695
Plus: Annual Increase 1/				
Annual Increase: 1974 Act	413		413	
Annual Increase: 1980 Act	13		13	
Annual Borrowing A. Increase	426	426	426	
Treasury Borrowing (Cash)				0
Less:				
Bond Amortization: 1974 Act	88		88	
Bond Amortization: 1980 Act	0		0	
Total BPA Bond Amortization 2/	88	88	88	88
Net Increase/(Decrease):				
1974 Act	325		325	
1980 Act	13		13	
Total	338	338	338	(88)
Cum. - End-of-Year: 1974 Act	2,958		2,896	
End-of-Year: 1980 Act	750		703	
End-of-Year: Total	3,708	3,666	3,598	2,608
Remaining Leg. Borrowing A.:				
1974 Act	(458)			
1980 Act	500			
Total Borrowing Authority	42	84		1,143
Total Legislated Borrowing A.	3,750	3,750		3,750

1/ FY 1995 is actuals. FY 1996-2001 are based on the FY1997 Congressional Budget Submittal
Bonneville is exploring options with its customers and constituents to reduce its level of debt financing in order to both delay the exhaustion of the borrowing authority caps and improve Bonneville's debt-equity position. The options under consideration include: a) further reductions in capital spending through application of a capital budgeting process, b) revenue financing of roughly $15 million of transmission capital and $15 million of fish & wildlife capital per year, c) to the extent allowable, potentially shifting costs from the Transmission /Fish & Wildlife authority to the Conservation authority, and d) exploring alternative sources of capital, including the use of third-party financing to the greatest extent possible. The options to be adopted will be determined through process of developing the 96 Rate Case in May.
2/ FY 1995 is actual. FY 1996-2001 are based on the 1996 Supplemental Rate Proposal and will be updated following completion of Bonneville's 1996 rate case in May.

EXTENDING BORROWING AUTHORITY

Mr. Myers. What steps are being taken to extend the use of the borrowing authority?

Mr. Hardy. BPA's authority to borrow from the U. S. Treasury is legislatively capped in total at $3.75 billion of bonds outstanding. Of this total, $2.50 billion is for transmission and other Federal capital investment purposes, cap 1. The remaining portion, $1.25 billion, is reserved for conservation and renewable resources purposes, cap 2.

At the end of FY 1995, $2.74 billion of the total $3.75 billion cap had been obligated. BPA has taken measures to extend availability of current authority to borrow at least through FY 2001. These measures include: substantial cuts in BPA's capital program investments; use of third party sources of capital to the extent feasible; a shift of bonds and amortization from cap 1 to cap 2 if allowable and prudent, and use of current revenues rather than Treasury borrowing to fund a portion of BPA capital investments. Had Bonneville not taken these measures, remaining borrowing authority would have been depleted by FY 1997

REFINANCING BONNEVILE'S DEBT

Mr. Myers. Please summarize the effect of the current legislation to refinance the Bonneville debt.

Mr. Hardy. The current legislative proposal would direct Bonneville to "refinance" its estimated $6.7 billion in outstanding repayment obligations on appropriations at the end of FY 1996 by re-setting the outstanding principal at the present value of the principal and annual interest that Bonneville would pay to the U. S. Treasury in the absence of the bill, plus $100 million. The new principal amount is projected to be about $4.2 billion. Interest rates on the new principal amounts would be reassigned at prevailing Treasury yield curve interest rates at the time of the transition, October 1, 1996. This would raise the average interest rates from 3.4 percent to an estimated 7 percent. Other repayment terms and conditions would remain essentially unaffected.

The effect on Bonneville and the Northwest ratepayers is enhanced long-term rate stability. The legislation includes a provision directing Bonneville to offer a contractual commitment to its customers that these appropriations repayment obligations will not be increased in the future.

The net effect of the refinancing legislation to the U. S. Treasury is to return about $100 million more to the Treasury in present value terms than it would have received under the old payment schedule. This additional $100 million is analogous to a refinancing fee.

According to Congressional Budget Office figures, the refinancing "fee" combined with other elements of the refinancing package will increase near-term cash flow to the government and reduce the federal budget deficit by $94 million over seven years while removing the threat of substantially increased electricity rates in the Northwest. BPA is updating these estimates in its current power rate proceedings.

The current version of the bill would also amend the Confederated Tribe of the Colville Reservation Grand Coulee Dam Settlement Act. Current law does not allow a credit in 1996 that reduces the BPA Administrator's payment to Treasury. Specifically, it allows $15.85 million in FY 1997, $16.49 million in FY 1998, $17.15 million in FY 1999, $17.84 million in FY 2000, $18.55 million in FY 2001, and $4.1 million thereafter.

COLVILLE SETTLEMENT

Mr. Myers. Please describe the Colville Indian settlement and subsequent legislation.

Mr. Hardy. In April 1994, The Confederated Tribes of the Colville Reservation and the United States of America through the Department of Justice and the Bonneville Power Administration signed a settlement agreement concerning a law suit filed in 1951 by the Colville Tribes. The Tribes claimed that the Government had taken some of their Reservation land to construct Grand Coulee dam and had promised to pay them a share of the revenues of the dam each year and that the Government had failed to live up to its promise.

The settlement reached with the Colville Tribes contains two parts: a lump sum payment from the Judgment Fund of $53 million for past use of reservation lands, and annual payments from Bonneville beginning in 1996 for continued use of reservation lands. The Confederated Tribes of the Colville Reservation Grand Coulee Dam Settlement Act, passed in October 1994, authorized the Department of Justice and Bonneville to make the payments agreed to in the settlement.

Based in part on Grand Coulee Dam's projected revenues and costs during fiscal year 1995, the first annual payment was fixed at $15.25 million. Subsequent payments are tied to increases in Bonneville's power prices and annual generation at Grand Coulee Dam. Therefore, future payments under the settlement are a function of three items: the initial payment; the change in Bonneville's rates; and the annual generation of power at Grand Coulee Dam. In addition, the agreement contains floor and ceiling payment constraints to ensure that the increase in payments does not diverge too greatly, in either direction, for the rate of inflation. This provision reduces both parties' risks over time.

COLVILLE SETTLEMENT

Mr. Myers. How does that settlement impact Bonneville funding and the annual Treasury payment?

Mr. Hardy. Bonneville will pay the full amount of the annual settlement payment to the Colville Tribes but will receive a credit for a portion of the annual settlement payment on its interest payment to the Treasury.

The present value of BPA's projected annual payments to the Colville Tribes is approximately $513 million, or 90 percent of the settlement's total value. Under the Colville Settlement legislation, beginning in fiscal year 2000, Bonneville will receive an offset on its interest payments to the Treasury equal to 26 percent of each annual payment to the Tribes. Together with the lump sum payment from the Judgment Fund of $53 million, the offset results in the Treasury paying 30 percent of the total value of the settlement, with Bonneville ratepayers paying 70 percent instead of 90 percent.

STAFFING

Mr. Myers. Please provide a chart showing the FTEs and end of year employees for each year since 1990.

Mr. Hardy. The end of year FTEs and employees for each year since 1990 are shown on a table which I would like to insert for the record. The information follows:

	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	Budget Projection FY 1996
FTE	3,281	3,399	3,667	3,740	3,596	3,313	3,272 (EOY)
Employees	3,282	3,674	3,746	3,804	3,562	3,274	3,216 (Current)

EMPLOYMENT REDUCTIONS

Mr. Myers. At the conference on last year's appropriation bill, it was stated that Bonneville would need to reduce employment by 10%. Please provide the basis for that statement, including a chart showing the reductions by year to reach the 300 number.

Mr. Hardy. Since FY 1994, Bonneville has reduced employment by more than 9 percent in order to streamline our organization and preserve the agency's competitiveness.

In March of 1994, Bonneville's had 3,755 federal filled positions. Bonneville FTE usage for all of FY 1994 was 3,596, whereas our FY 1993 FTE usage was 3,740. Bonneville's actual FY 1995 employment was 3,313 FTE. Bonneville's FY 1996 and FY 1997 FTE allocation is 3,272.

BPA's FY 1997 FTE internal planning target is 3,255. We are currently operating below this target. We currently have 3,216 employees on board, 14.4 percent below our March 1994 level of employment. This target is 13.0 percent below Bonneville's highest annual FTE usage in FY 1993 and 9.5 percent below our FY 1994 FTE usage.

The actual reductions by year are as follows:

	FY 1994	FTE 3,596		
	FY 1995	FTE 3,313	-283	
Budget Projection	FY 1996	FTE 3,272	-324	9.5% reduction (FY 1994 - FY 1996)

SEVERANCE AUTHORITY

Mr. Myers. Bonneville has been given authority to provide a $25,000 severance payment to employees. How many employees have been terminated or left the agency since the legislation was enacted?

Mr. Hardy. The legislation granting Bonneville Power Administration the authority to grant a voluntary separation incentive of up to $25,000 to separating employees was contained in the Energy and Water Development Appropriations Act, Public Law 104-46, signed by the President on November 13, 1995.

Bonneville started utilizing the legislation on December 19, 1995. There have been 32 separations from that date until March 19, 1996. We also have an additional 20 separations planned for FY 1996 and 160 employees have signed up to leave under the VSI authority in 1997

The full cost of this separation incentive is paid by Bonneville's customers. Bonneville anticipates that in order to meet its wholesale electric rate targets and remain competitive in the electric marketplace it will be necessary to reduce Bonneville FTE levels by at least another 100 over the next few years. Bonneville anticipates that the separation incentive payment authority will be the primary vehicle used to achieve these additional reductions.

SEVERANCE PAYMENTS

Mr. Myers. How many have received the $25,000 severance payment?

Mr. Hardy. Of the 32 separations from December 19, 1995, through March 19, 1996, 18 of those separations were eligible for the $25,000 separation incentive and received part or all of that amount. We also have an additional 20 employees in FY 1966 and 160 employees in FY 1997 signed up to separate under the VSI authority.

The legislation was sought to alleviate the budget impacts of deregulation of the utility industry. Bonneville is currently undergoing a top to bottom re-engineering and redesign effort. The Bonneville separation incentive program will be utilized in a targeted fashion to facilitate further staff reductions coming out of those efforts. It is expected that there will be increased utilization after October 1, 1996, the target crossover date to the new organization.

SEVERANCE RECIPIENTS

Mr. Myers. Please provide the job title and number of years of federal employment for each employee who received the $25,000 severance payment.

Mr. Hardy. The job title and number of years of federal employment for each employee who received the $25,000 severance payment are shown in a chart which I would like to insert for the record. The information follows:

Job Title	Years of Service	Amount Received
Program Analyst	21 years, 6 months	$25,000
Commodity Manager	28 years, 7 months	$25,000
Manager, Office Support Services	11 years, 5 months	$25,000
Computer Specialist	20 years, 7 months	$25,000
Public Utilities Specialist	25 years, 1 month	$25,000
Mathematician	20 years, 7 months	$25,000
Supervisory Electrical Engineer	17 years, 3 months	$25,000
Management Analyst	25 years, 6 months	$25,000
Fish and Wildlife Project Manager	25 years, 4 months	$25,000
Personnel Management Specialist	20 years	$25,000
Financial Specialist	29 years, 9 months	$25,000
Systems Accountant	31 years, 10 months	$25,000
Right-of-Way Maintenance Inspector	18 years, 3 months	$25,000
Public Affairs Clerk	51 years	$24,600
Electrical Test and Development	33 years, 11 months	$25,000
Heavy Mobile Equipment Mechanic	15 years, 1 month	$25,000
Commodity Manager	29 years, 10 months	$25,000
Administrative Specialist	16 years, 4 months	$25,000

BONNEVILLE ATTRITION RATE

Mr. Myers. What has been the rate of attrition for Bonneville employees for each year since 1985.

Mr. Hardy. We do not have historical records for Bonneville's attrition rate accessible at this time, but we will provide it for the record when it's available . Bonneville historically has had an attrition rate of from 2 to 4 percent The last few years have been exceptionally volatile due to a continuing limited hiring freeze, and the onset of the DOE Voluntary Separation Incentive Program in April 1994. In FY 1995 the attrition rate was 6.4 percent.

STRATEGIC ALIGNMENT REDUCTIONS

Mr. Myers. What level of employee reductions was assumed for Bonneville in the Department's Strategic Alignment Initiative?

Mr. Hardy. Aggressive actions by Bonneville management to lower employment levels began prior to the Strategic Alignment Initiative. In August of 1994, the Administrator announced a goal of reducing employment by 500 FTE. This represented a 13.3 percent reduction in the workforce compared to the March 1994 onboard strength of 3,755. Bonneville had shed more than 400 federal employees by the time the Secretary announced the results of the Strategic Alignment Initiative in August 1995.

The Strategic Alignment Initiative study team made no specific recommendations on Bonneville or any of the Power Marketing Administrations because at that time the President's Budget assumed Bonneville would become a government corporation outside of the Department of Energy, and the other power marketing administrations would be privatized. The Department, however, assumed that Bonneville would continue to reduce its employment in accord with previously announced streamlining plans. The streamlining plan anticipated a reduction to 3,400 in 1995, but Bonneville's actual use for 1995 was 3,313. Bonneville's FY 1996 allocation is 3,272, and Bonneville's FY 1997 internal planning target is 3,255, although we expect this number may end up lower due to our reengineering efforts and use of VSIs.

TREASURY PAYMENTS

Mr. Myers. Please identify all activities and the amount of each which will be credited to Bonneville's payment to Treasury in fiscal years 1995, 1996 ,and 1997.

Mr. Hardy. I will provide a table for the record. The table follows:

	FY 1995	FY 1996 \1 ($ in million)	FY 1997 \1
Interest			
BPA Bonds	168,000	144,000	165,000
BPA Appropriations	55,000	57,000	59,000
Corp of Engineers & Lower Snake Compensation Plan	144,000	148,000	154,000
Bureau of Reclamation	31,000	30,000	31,000
Associated Projects Cost			
Bureau of Reclamation	29,000	35,000	75,000
Corp of Engineers & Lower Snake Compensation Plan	97,000	85,000	88,000
Capital Transfers			
BPA Bond Amortization	222,000	259,000	257,000
3rd AC Non-Federal Participation	156,000		
Corp of Engineers & Lower Snake Compensation Plan	98,000	5,000	6,000
BPA Appropriations Amortization		3,000	
Total, Treasury Payments	1,000,000	766,000	835,000

\1 This estimate has been updated as part of Bonneville's 1996 Supplemental Rate proposal and will be finalized when rates are filed with the Federal Energy Regulatory Commission. The rates are expected to be in place by the beginning of FY 1997.

EASTERN CANADIAN INTERTIE

Mr. Myers. Describe the need for appropriation language requested for construction of the Eastern Canadian Intertie (Coulee-Oliver) facilities.

Mr. Hardy. The Federal Columbia River Transmission System Act of 1974 requires specific approval by act of Congress for initiation of construction of any major transmission facility. This express aprroval is sought through appropriation language, even though Bonneville is not seeking appropriations. The Eastern Canadian Intertie, Oliver Delivery, Project would be a major transmission facility that is necessary to return Canada's share of the downstream power benefits, Canadian Entitlement, to Canada as required by the Columbia River Treaty between the United States and Canada. Bonneville Power Administration and the U.S. Army Corps of Engineers, as the U.S. Entity under the Columbia River Treaty, were involved in negotiations with the Canadian Entity (BC Hydro) and the British Columbia government to find a mutually beneficial arrangement to deliver Canadian Entitlement power to Canada, beginning in 1998. Last September, representatives of the Canadian Entity, the BC government and the U.S. Entity signed a non-binding memorandum that laid out principles for detailed negotiations. However, due to the rapidly changing economic conditions in the utility industry, the U.S. Entity decided to withdraw from negotiations based on the need to protect the economic interests of its customers utilities and the regional ratepayers. The U.S. Entity remains open to the possibility of restarting negotiations at a future date to attempt to reach a mutually satisfactory agreement for delivery of Canadian Entitlement power. Budget estimates, starting in FY 1996, and necessary authorizing language in the Appropriations Language sheet are included in the FY 1996 Congressional Budget for the Eastern Canadian Intertie (Grand Coulee Dam to the Canadian Border 'Oliver') facility. This facility will provide transmission facilities that are required for returning the Canadian Entitlement power to BC Hydro, under the 1964 Columbia River Treaty, and will increase power transfer capability between the U.S. and Canada. Under the Columbia River Treaty and related agreements, the Canadian Entitlement must be returned to Canada starting in 2003. Therefore, it is necessary to have appropriation language for this project at this time to ensure that the United States will have the transmission facilities necessary to return the Canadian Entitlement in 2003.

EASTERN CANADIAN INTERTIE COST

Mr. Myers. What is the estimated cost of this project?

Mr. Hardy. The total estimated cost at completion for the Eastern Canadian Intertie, Oliver Delivery, Project is $97.7 million.

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